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ENTRIES 1-624

W. J. Dorsey

BOTANICAL ABSTRACTS

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BOTANICAL ABSTRACTS

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J. R. SCHRAMM, Editor-in-Chief
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Vol. 13 JANUARY, 1924 No. 1

ENTRIES 1-624

AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 356, 500, 506, 517, 522, 560, 598, 599)

1. ANONYMOUS. **Agricultural research at Rothamsted.** [Rev. of: ANONYMOUS. **Report 1918–20 with the Supplement to the "Guide to the Experimental Plots."** *86 p.* D. J. Jeffery: Harpenden, 1921.] Nature 108: 29. 1921.—A brief statement is made of the kind of work being done at Rothamsted.—*C. V. Piper.*

2. ANONYMOUS. **De bestrijding van herik (Sinapis arvensis L.) en knopherik (Raphanus raphanistrum L.).** [Control of Sinapis arvensis and Raphanus raphanistrum.] Tijdschr. Plantenziekten 28: 53–57. 1922.

3. BABOWITZ. **Ergebnisse der Klee und Gras-Sorten und Herkunftsversuche.** [Report on clover and grass varieties and origin-studies.] Mitteil. Deutsch. Landw. Ges. 38: 245–248. 1923.—Tests were made in 1921 and 1922 of clover and the following grasses: Statthafer (*Arrhenatherum elatius*), Weidegras (*Lolium perenne*), Wiesenschwingel (*Festuca pratensis*), *Phleum pratense, Dactylis glomerata.* Clover seed from Silesia, East Prussia, the Rhineland, Denmark, Bohemia, and France as well as their specially bred strains were tested. The highest scores were given to a special strain listed as "Lambkes," to the Rhineland and to the Silesian clovers. Analyses are given showing protein, fat, and water-free extract. Of each of the grasses 2 or more strains were tested.—*A. J. Pieters.*

4. BLAKELY, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales 34: 406–408. *1 fig.* 1923.—Mediterranean thistle (*Carthamus dentatus*) has made its appearance in N. S. W. and will apparently prove to be a serious pest. A specimen of the plant was reported in 1921, but at that time it was confused with the saffron or false star thistle (*C. lanatus*). Methods of control are suggested.—*L. R. Waldron.*

5. BLAKELY, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales 34: 489–491. *1 fig.* 1923.—Silver-leaved nightshade (*Solanum elaeagnifolium*) was first found in N. S. W. in 1923, at 2 stations. The plant is described and methods are suggested for eradication.—*L. R. Waldron.*

6. BRESAOLA, M. **Note di cerealicoltura.** [Notes on cereal culture.] Staz. Sper. Agrar. Ital. 55: 318–381. 1922.—Cultural trials on several varieties and strains of wheat, oats, and corn are reported.—*A. Bonazzi.*

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7. Bresaola, M. **Sulla più conveniente quantità di seme necessaria per la formazione dei prati di medica, e di trifoglio.** [Most appropriate quantity of seed of clover and alfalfa to be used.] Staz. Sper. Agrar. Ital. 55: 469–479. 1922.

8. Brooks, C. **Some notes on prickly pear.** Agric. Gaz. New South Wales 34: 493–496. *1 fig.* 1923.—Prickly pear is of some value as stock feed but causes much damage to pastures. The most effective method of eradication is digging and burning the plant, costing $20 per acre or more. The best spray available is one carrying arsenious chloride. Of different mechanical methods of eradication, crushing by dragging a heavy log seems most effective; once over kills about 60 per cent of the plants.—*L. R. Waldron.*

9. Chmelař, F. **Bericht über die Prüfung von Tabaksorten.** [Report of variety tests with tobacco.] Wiener Landw. Zeitg. 73: 86. 1923.—A report is made on the yield and crop value of 7 varieties of tobacco tested at Brunn in 1921–22.—*F. Weiss.*

10. Christensen, I. C. **Det danske Hedeselskabs Virksomhed og Fremtidsopgaver.** [The society for the cultivation of the Danish heather and bog country.] Tidsskr. Landokonomi 7: 301–333. 1923.—About 50 years ago western and northern Jutland consisted mainly of bogs and heather. The Danish Heather Society, composed mainly of capitalists and agriculturists, was formed with the object of placing this large area under cultivation; as a result, little is now left of the Danish heather.—*Albert A. Hansen.*

11. Claus, Eugen. **Anbauversuche nach der Gulichschen Kartoffelkultur-Methode.** [Cultural experiments with potatoes according to Gulich's method.] Oesterreich. Zeitschr. Kartoffelbau 2: 41. 1923.—In this method potatoes are spaced wide apart and the bases of the shoots are kept hilled up to induce branching and the setting of numerous tubers to the plant. The gross yield is less than that obtainable from ordinary cultural methods but is very economical in the use of select seed.—*F. Weiss.*

12. De Capitani, S. **Le condizioni meteoriche, di suolo e di coltura in rapporto alla irrigazione.** [Meteoric, soil and cultural conditions in their relation to irrigation.] Staz. Sper. Agrar. Ital. 56: 67–111. 1923.—A thorough general review of the subject is presented with, however, no original contributions.—*A. Bonazzi.*

13. Dokken, Konsulent Ivar. **Danmarks Omsaetning med Udlandet af Landbrugsprodukter og Hjaelpestoffer for Landbruget i Aarene 1914–21.** [Export of Danish agricultural products, 1914–1921.] Tidsskr. Landokonomi 8: 345–371. 1923.—An account is given of the agricultural exports during the war period and an announcement of the resumption of the annual government reports.—*Albert A. Hansen.*

14. Dutruel, Edmond. **La reconstitution d'une ferme dévastée.** [The reconstruction of a devastated farm.] *88p.* Desclée, de Brouwer & Cie.: Lille, France, 1922.—The agricultural history of a farm, in the north of France, near Lille, is given, including detailed description of its geological features and of the gradual improvement in fertility secured by the ancient owners following the most progressive agricultural practices. The farm was occupied by the German army 1914–1918. The agricultural practices adopted for restoring this shell torn farm to its pre-war productivity are described. In 1920 a limited area could be seeded to wheat and yielded 30 bushels per acre; in 1921 45 bushels per acre were obtained (the pre-war yield was 52–60 bushels.) Details are given referring to the rotations adopted and to the cultivation of crops as sugar and forage beets, alfalfa, flax, horse beans, wheat, oats, barley, potatoes, and other small crops. A discussion on the care and feeding of livestock is included.—*Cesare Longobardi.*

15. Easterby, H. T. **Annual report of the Director of Sugar Experiment Stations Sept. 30, 1922. IV.** Australian Sugar Jour. 15: 153–155. 1923.—A report is given of laboratory analyses of cane, of newly imported canes from Java, Hawaii, and the Philippine Islands, and of the sugar canes grown at the Kairi State farm near Atherton. Eight years ago some of the older varieties of cane, which appeared to be deteriorating, were planted at Kairi, where it was thought they might be rejuvenated if they remained for some years in the higher elevation and colder climate. The canes were Rose Bamboo or Rappoe, Striped Singapore or Mauritius Gingham, Meerah, Goru, and Badila. Four years ago they were planted at the Innesfail, Bundaberg, and Mackay Experiment Stations. They grew rapidly and the improvement in hardiness was marked when compared with the same varieties of cane plants which had been raised on the coast.—*C. Rumbold.*

16. EDLER, WILH. **Die Ergebnisse der Saatenanerkennung beim Getreide im Deutschen Reiche 1922.** [**Results of seed certification of grains in the German Empire, 1922.**] Mitteil. Deutsch. Landw. Ges. **38**: 488–500. 1923.—A tabulated statement is presented of the areas of winter and summer rye, wheat and barley, and of oats certified in the various provinces and states of Germany. The varieties of each kind are arranged in the order of the size of the area certified.—*A. J. Pieters.*

17. ETHERIDGE, W. C., AND C. A. HELM. **Productive methods for soybeans in Missouri.** Missouri Agric. Exp. Sta. Bull. 195. *30 p.* 1922.—Results are given of variety and cultural experiments, 1916–1921; also a general discussion of soybean culture.—*L. J. Stadler.*

18. FERDINANDSEN, C. **Ukrudtets Betydning for Plantesygdomme.** [**Influence of weeds on plant diseases.**] Tisskr. Landokonomi **6**: 266–280. 1923.—This report of a lecture before the Royal Danish Agricultural Society emphasizes the necessity of keeping the farm free of weeds, thus lessening the chances for the entrance of plant diseases.—*Albert A. Hansen.*

19. FISKE, JESSIE G. **Result of seed and legume inoculant inspection for 1921.** New Jersey Agric. Exp. Sta. Bull. 360. *37 p.* 1922.—A statement is given of the requirements and value of the New Jersey Seed Law of 1916 and the results of the analysis of official samples of seed. There is included also a summary of the New Jersey regulations governing the sale of legume inoculants as well as the results of tests of official samples.—*Wm. H. Martin.*

20. GULDBERG, A. **Om Vakstfaktorernes Virkningslov.** [**The law of the effect of growth factors.**] Nordisk Jordbrugsforskning **1922**: 307–310. *2 diagr.* 1922.—Critical remarks are presented on a paper by Mitscherlich [see Bot. Absts. 13, Entry 38].—*Ernst Gram.*

21. HARRIS, E. **Standards for wheat.** Agric. Gaz. New South Wales **34**: 469. 1923.—These standards are for Australia and include 2 classes and "unclassified." Class 1 includes Australian white wheat and class 2 Australian hard white wheat. Number 1 white wheat must contain 95 per cent sound wheat weighing not less than 63 pounds per Imperial bushel, and number 2 white wheat shall weigh not less than 60 pounds per bushel. Wheat not equal to grade requirements is designated either as smutty or sample wheat.—*L. R. Waldron.*

22. HARRISON, E. **Sugar cane experiments in Natal.** South African Sugar Jour. **7**: 521–535. 1923.—Detailed results and tables are given of experiments completed in 1915 at the Winkle Spruit Experimental Farm. They relate to tests of varieties of imported sugar cane and of manuring experiments with Uba cane.—*C. Rumbold.*

23. HAUNALTER, EMIL. **Die Abstammung der Kartoffelsorten.** [**The origin of potato varieties.**] Oesterreich. Zeitschr. Kartoffelbau **2**: 45–48. *2 insert charts.* 1923.—A brief account is given of the origin of modern cultivated varieties of potatoes with particular reference to those grown in Germany and Austria. Attention is called to the importance of certain foundation stocks such as Rough Purple Chili, Garnet Chili, Early Rose, Daber, and Erste von Frömsdorf, as the ancestors of nearly all the best of modern varieties, and a genetic tree is worked out showing these relationships. This tree is presented in 2 charts with conventional signs to show the parentage, the manner of origin—whether by "graft hybridization" or from true seed, and the breeder's name for the principal German potatoes. A table is also given, showing, for the foundation varieties named above, the immediate progeny and other descendants.—*F. Weiss.*

24. HENGL, FRANZ. **Zur Ueberwinterung der Saatkartoffeln.** [**Overwintering of seed potatoes.**] Oesterreich Zeitschr. Kartoffelbau **2**: 49. 1923.—This is a transcript of a report by the experiment station of Berne-Liebefeld, Switzerland, the 1st part of which appeared under the title: SCHMID. Essais comparatifs sur l'hivernage des semenceaux de pommes de terre en cave ou silos. [Comparative studies on overwintering of seed potatoes in pits or storage bins]. La Terre Vaudoise **1922**[16]. There was 5 per cent less shrinkage in potatoes stored in pits, the condition of dormancy was better, and a superior stand and a larger yield of marketable tubers were secured. Directions for the construction of potato pits are given.—*F. Weiss.*

25. HEUSER, W. **Versuche über das Verhalten verschiedener Weizensorten gegen verschieden starke Düngung.** [**Investigations concerning the behavior of different varieties of wheat toward various concentrations of fertilizers.**] Mitteil. Deutsch. Landw. Ges. **38**: 182–185. 1923.—Rapid growing, slow growing, and intermediate varieties were tested as to

ability to utilize normal and double normal amounts of complete fertilizers. In 1920–21 the season was dry and the rapid growing variety with xerophyll characters utilized both normal and double normal fertilizers best; the slow growing variety showed practically no effect from the fertilizer. In 1921–22 the season was normal in respect to precipitation and the hygrophyll or slow growing variety gave the greatest increase in yield from fertilizers. The author concludes that with sufficient moisture the hygrophyll varieties utilize the fertilizers best and that there is a relation between the transpiring ability of a variety and its utilization of fertilizer material in the soil.—*A. J. Pieters.*

26. Hilgendorf, F. W., and J. W. Calder. **The best stage for cutting wheat.** New Zealand Jour. Agric. **26**: 354–357. 1923.—A statistical experiment to determine the best date for harvesting showed that wheat should be cut "when the green has been replaced by yellow in the top internode of 99 per cent of the straws; all knots are still green; no dough can be squeezed out from the grain, but the grain is still soft enough to cut with the thumb nail."—*N. J. Giddings.*

27. Hopf. **Mängel beim Kartoffelpflanzen. [Failures with potato plants.[** Mitteil. Deutsch. Landw. Ges. **38**: 461–462. 1923.—Personal experience in successful potato growing is recounted.—*A. J. Pieters.*

28. Jack, H. W. **Rice in Malaya.** Malayan Agric. Jour. **11**: 103–119, 139–169. *Map, diagr. A–B.* 1923.—The total area of rice cultivation in the Malay Peninsula in 1921 was 669,262 acres (more than ½ being in the Native States of Kedah and Kelantan), or ⅕ acre per head of population. To make the country self-supporting at present average production, an area of 0.62 acre per head would be necessary. The best rice soils are those with a high proportion of clay and with little sand; peaty soils are unfavourable. Cultivation methods for both wet and dry rice are described; for the latter, present methods could be much improved. In planting out from the nursery each hill, containing 3 seedlings, occupies 1.5–2 square feet on good soil where tillering is high. Tillering depends on fertility of soil, spacing, and depth of water; 18–20 tillers per plant is a good average. Flowering takes place 2–6 months after planting out; each flower remains open about 20 minutes, and self-pollination is the rule. Methods of harvesting, threshing, and milling (native and introduced) are described; statistics are given of variation of total crop and of yield per acre. A section deals with pests and diseases; rats and birds may cause serious loss; sucking, stem-boring and leaf-eating insects present difficult problems; pests of stored grain are also enumerated. Fungus diseases are not as a rule serious. A final section deals with the economics of rice production in Malaya.—*R. E. Holttum.*

29. Janchen, Erwin. **Die Erkennung der Kartoffelsorten. [The recognition of potato varieties.]** Oesterreich. Zeitschr. Kartoffelbau **2**: 42–44. 1923.—A key is presented to the varieties of potatoes grown in Austria (including several of German and English origin.) The system of grouping varieties is that devised by K. Snell. Kartoffelsorten. Allgemeine und spezielle Sortenkunde. [Potato varieties. General and varietal classification.] 2nd. rev. and enlarged ed. Arbeit. Forschungsinst. Kartoffelbau 5. *118 p., 2 col. pl., 13 fig.* 1922. The varieties are grouped in the following classes: (1) tubers white-skinned and white-fleshed, round; (2) tubers white-skinned and white-fleshed, long; (3) tubers white-skinned and yellow-fleshed; (4) tubers red-skinned and white-fleshed; (5) tubers blue-skinned; (6) tubers mottled. The groups are sub-divided according to the shape of the tuber, the color of the sprouts (in light), the characters of the eyes, the flower color, and the growth habit of the plant. [See also Bot. Absts. 12, Entry 1599.]—*F. Weiss.*

30. Janchen, Erwin. **Einige Beobachtungen an österreichischen Landsorten von Kartoffeln. [Observations on local potato varieties in Austria.]** Oesterreich. Zeitschr. Kartoffelbau **2**: 39–40. 1923.—This gives tuber and plant descriptions of 5 local varieties of potatoes cultivated in Austria, and discusses their horticultural relationships.—*F. Weiss.*

31. Janchen, Erwin. **Einige Beobachtungen an schottischen Kartoffelsorten. [Observations on Scotch potatoes.]** Oesterreich. Zeitschr. Kartoffelbau **2**: 3–4, 6–8. 1922 [1923].—Systematic descriptions are given of 10 British potato varieties based on the growth of the plants in Austria in 1921. [See also Bot. Absts. 11, Entry 3323.]—*F. Weiss.*

32. KÖCK, GUSTAV. **Ergebnisse der Umfrage über das Verhalten der im Jahre 1921 in Oesterreich eingeführten englischen Kartoffelsorten.** [**The performance of English potato varieties in Austria in 1921.**] Oesterreich. Zeitschr. Kartoffelbau **2**: 25–28, 31–32. 1923.—The variety Up-to-Date yielded heavily but was very subject to late blight tuber rot. Arran Comrade and King George were the most noteworthy additions to Austrian potato culture in regard to adaptability, yield, and freedom from disease.—*F. Weiss.*

33. LEVY, E. BRUCE. **The grasslands of New Zealand.** New Zealand Jour. Agric. **24**: 70–79, 147–158, 193–205, 266–272. 1922; **25**: 65–75, 193–205, 257–267; **26**: 16–28, 263–279, 334–343. 1923.—Peat swamp lands should be pastured to obtain the consolidation resulting from stock trampling the soil. *Lotus major*, *Paspalum*, and Yorkshire fog are good plants for freshly drained areas. Methods of preparing land, including burning, are described, desirable rotations discussed, and seed mixtures for high sunny and for partly sheltered low areas recommended. Perennial rye grass, Kentucky blue grass (*Poa pratensis*), twitch grass (*Agropyron repens*), and red top (*Agrostis alba*) are considered good species for long rotations. Red clover and Western Wolth's [Westernwolths in the U. S. A., Westerwoldsch in Netherlands], rye grass, or red clover and Italian rye grass are recommended mixtures. It is generally inadvisable to sow temporary grasses, cereals, or such crops as rape with grasses which are intended for the establishment of permanent pastures. Coastal sand areas may be established in grass by a series of plantings or sowings. The first step should be to establish plants of marram grass (*Ammophila arenaria*), silvery sand grass (*Spinifer hirsutus*), pinago (*Scirpus frondosus*), or sand fescue (*Festuca littoralis*) on the "fore dune;" tree lupine (*Lupinus arboreus*) may then be sown on the leeward side, and this will flourish for 3–4 years. The tree lupine has no forage value but adds much humus to the soil. As soon as the lupine begins to decline a good grass such as *Paspalum dilatatum* or buffalo grass (*Stenotaphrum glabrum*) should be sown or planted. Suggested seed mixtures for different types of soil are given in tabular form under 47 heads and sub-heads, according to soil type or purpose of seeding. Quality of seed and methods of sowing are also discussed.—*N. J. Giddings.*

34. LINDHARD, E. **Dyrkningsforsog med Sukkerroefro, avlet paa sorterede og Usorterede Roer.** [**Experiments with sugar beets from seed grown on sorted and unsorted roots.**] Tidsskr. Planteavl **29**: 321–328. 1923.—The experiments demonstrated that the selection of the largest roots for seed production gives an increase in root yield and a slight decrease in sugar content and dry matter in the offspring.—*Albert A. Hansen.*

35. LINDHARD, E. **Opgørelse af Markforsøg.** [**Computation of field experiments.**] Nordisk Jordbrugsforskning **1922**: 228–232. *1 diagr.* 1922.—The author gives a simpler way of eliminating field inequalities than that sugested by Mitscherlich [see Bot. Absts. 13, Entry 38.]—*Ernst Gram.*

36. M. **Ueber Phosphorsäuredüngung im Zusammenhang mit den Vorschlagen Aereboes.** [**Concerning phosphoric acid fertilization in respect to Aereboe's proposals.**] Wiener Landw. Zeitg. **73**: 25–26. 1923.—This is a critical discussion of Aerebe's theory that phosphate fertilizer may in part be dispensed with if the feeding power of plants is increased by application of large quantities of nitrogen and potash, and that the solubility of phosphate compounds in the soil is increased by the use of physiologically acid fertilizers.—*F. Weiss.*

37. MARTIN, WM. H. **Potato growing in New Jersey.** New Jersey Agric. Exp. Sta. Circ. 140. *31 p., 11 fig.* 1922.—This is a popular discussion of potato growing, including soil requirements, cultivation, fertilizers, varieties, size of seed, planting, diseases and insects.—*Wm. H. Martin.*

38. MITSCHERLICH, E. A. **Om Vækstfaktorernes Virkningslov.** [**The law of the effect of growth factors.**] Nordisk Jordbrugsforskning **1922**: 161–184. 1922.—In fertilizer and variety tests jars are in one way far better than field experiments, as a group of growth factors may be present in optimum. The inequalities of soil in field tests may be largely eliminated by a special grouping and computation of replicate plots outlined. Every growth factor has a specific efficiency factor, independent of the relations of the other growth factors. The plant production is determined by a group of growth factors of which each has a specific quantitative and qualitative influence on the yield. When a factor is augmented the yield increases in proportion to the difference between the actual and the maximal yield. This increase is large

when the corresponding efficiency factor is large, and when the factor is present in small quantities. The efficiency factor of a growth factor is independent of the species of plant chosen for the experiment. Several examples are given of the computation of growth factors and their efficiency factor. [See also Bot. Absts. 13, Entries 20, 35.]—*Ernst Gram.*

39. Morettini, A. **Influenza dei trattamenti cuprici sulla produttività del frumento.** [**Influence of treatments with copper salts on the productivity of wheat.**] Staz. Sper. Agrar. Ital. **55**: 265–277. 1922.—The author continues here a series of investigations reported earlier [see Bot. Absts. 11, Entry 4384]. He compares the effect of the pre-soaking treatment with the treatment with 0.5 per cent $CuSO_4$, Caffaro powder, and $CuCO_3$. The production of the untreated control was 17.30, with the pre-soaking, 17.00, with $CuSO_4$, 17.53, with Caffaro powder, 17.66, and with $CuCO_3$, 18.54 quintals per hectare, when a durum wheat was used. The treatments affected the germination of the seed in the same order. The last 2 treatments permit greater germination than the others, and the author believes that this is due to the fact that soil fungi are hindered by the treatment and that the seed are thereby protected from their attack during germination. $CuSO_4$ may have acted unfavorably on the germinating embryo.—*A. Bonazzi.*

40. Münzberg, H. **Lupinensorten—Anbauversuche.** [**Lupine species—culture experiments.**] Mitteil. Deutsch. Landw. Ges. **38**: 413–414. 1923.—Lupine culture began in Prussia by imperial order of Frederick the Great in 1777. The yellow (*L. luteus*) and the blue (*L. angustifolius*) are now chiefly grown in Germany. Analyses are given of yellow, blue, and white lupine seed, and of the moist and dry yellow lupine seed after removal of the alkaloid.—*A. J. Pieters.*

41. Parker, W. H. **Report on potato maturity and yield trials, 1921 and 1922.** Jour. Nation. Inst. Agric. Bot. **I**: 5–19. 1922.—To counteract the effect of irregularity of soil the checker-board arrangement of plots, which assured the scattering of the 9 varieties from 8 different sources, was adopted in 1921. In 1922 the checker-board plan was repeated and 2 other sets were added with changes noted below. Checker-board II consisted of the 9 varieties from 1 district each repeated 8 times to eliminate differences due to source and to record only varietal differences. Checker-board III consisted of 8 different stocks of 1 variety repeated 9 times in order to eliminate varietal differences and to record only differences due to source.—Results indicate that place of origin apparently does not directly affect the yield or maturity of a variety; but in some districts the stock is affected more than usual with virus disease. In certain climates the symptoms of virus disease do not show themselves even in badly infected stocks. In 1921, an unfavorable year, there appeared to be a negative correlation between early maturity and high yield; the opposite was true in 1922, a favorable year.—*Walter M. Peacock.*

42. Pichler, Friedrich. **Ueber die in Oesterreich gemachten Erfahrungen mit Knöllchenbakterienkulturen.** [**Experience with cultures of nodule bacteria.**] Wiener Landw. Zeitg. **73**: 85–86. 1923.—Favorable results are reported from the use of seed-inoculating cultures of nitrogen-fixing bacteria, particularly with peas and beans.—*F. Weiss.*

43. Pitt, J. M. **Farmers experiment plots. Trials with mangolds, 1922–23. Central coast.** Agric. Gaz. New South Wales **34**: 409–412. *2 fig.* 1923.—The average yield of mangolds in New South Wales is about 25 tons per acre. The acreage of this crop is extremely limited. In a trial at Taree yields of 35–50 tons of roots per acre were secured under varying conditions of the experiment.—*L. R. Waldron.*

44. Pridham, J. T. **The proportion of grain to straw in wheat varieties.** Agric. Gaz. New South Wales **34**: 391–394. 1923.—Results are tabulated on 95 varieties and selections therefrom, in regard to length of time from date of sowing to heading, total yield of crop and yield of grain, and ratio of grain per sheaf for the 1922 crop. The highest percentage of grain, 44, was secured from Narrogin No. 8. Varieties were planted at different dates and a marked variation in percentage of grain was thus brought about.—*L. R. Waldron.*

45. Rosa, J. T. **Spraying Irish potatoes.** Missouri Agric. Exp. Sta. Bull. 198. *6 p.* 1923.—Experiments with lead arsenate, Bordeaux mixture, nicotine sulphate, and copper sulphate in 1921 and 1922 are reported. All treatments increased the yield.—*L. J. Stadler.*

46. Ruggeri, P. R. **Alcune osservazioni sull'accestimento dei frumenti in generale e della Romanella in particolare. [Studies on the stooling of wheats, the Romanella strain particularly.]** Staz. Sper. Agrar. Ital. 55: 447–468. 1922.—This is a biometrical study. The author concludes that plants of *Romanella*, which have a moderate power of stooling have a lesser number of culms at the time of cutting than those plants which have a greater stooling power. The latter also have a greater number of seed per culm.—*A. Bonazzi.*

47. Sampson, Arthur W. **Range and pasture management.** *421 p. 130 fig.* John Wiley & Sons, Inc.: New York, 1923.—This work is divided into 4 parts as follows: (1) the grazing industry and range control, discussing the pasture land and grazing control in the U. S. A. and the national forests, state and private grazing lands; (2) pasture revegetation and forage maintenance, discussing reseeding western grazing lands to cultivated forage plants, natural reseeding and maintenance of native western pasture lands, improvement and management of farm pastures, recognizing and correcting a declining forage yield, and principal introduced forage grasses and the principal introduced non grass-like forage herbs; (3) range and pasture protection, considering control of erosion or range and pasture, grazing on woodlands and its relation to the future timber supply, burning of pasture lands and its effects on forage protection, stock-poisoning plants and their control, principal stock-poisoning plants, and poisonous and mechanically injurious plants of secondary or local importance; (4) pasture improvements and research methods, including a discussion of the development of watering places for range and pasture stock, forage estimates as a basis for the rational use of grazing resources (grazing reconnaissance), grazing capacity and pasture inspection, research methods in range and pasture revegetation, and suggestions for instructions in pasture management and livestock production. The chapters conclude with a list of questions and a bibliography.—*Mary R. Burr.*

48. Sans, B. **Manuel d'agriculture marocaine. [Manual of Morrocan agriculture.]** *68 p., illus.* Librarie Delagrave: Paris, 1922.—This text book, suited for use in the elementary schools, contains 51 lessons in 5 chapters. The 1st chapter gives a botanical discussion of the plant and its functions, methods of cutting, layering and grafting, composition and types of soil, chemical or mineral fertilizers, green manure and animal manure. Temperatures, irrigation, conservation of water, and drainage are also discussed. The 2nd chapter deals with the culture of land, farm implements, crop rotations, cereals, and insects injurious to cereal crops. Forage plants, silage, root crops, oil plants, textile plants, vineyards and wine-making, and forests are considered. The 3rd chapter discusses the breeding of domestic animals. Chapter 5 discusses the enemies of the Morrocan farmers, chiefly rodents and insects; also the farmers' aids, such as carnivorous and insectivorous birds, and toads. In the last lesson the author emphasizes the value of agricultural education, stressing the desirability to the farmer of a knowledge of the Arabic language.—*Erma Brown.*

49. Schindler, Franz. **Handbuch des Getreidebaues auf wissenschaftlicher und praktischer Grundlage. [Handbook of cereal culture based on scientific and practical principles.]** *2nd ed., 500 p., 130 fig.* Paul Parey: Berlin, 1920.—This edition follows quite closely the general plan of the 1st, published in 1909, with additions and amplifications. A discussion of lodging of grains, tillering and root growth in relation to ridging and listing is included.—*Merritt N. Pope.*

50. Scurti, F., e G. Dragone. **Sull'impiego delle materie legnose per l'alimentazione del bestiame. [The use of woody substances for the feeding of animals.]** Staz. Sper. Agrar. Ital. 55: 13–23. 1922.—The authors studied the hydrolysis of the woody trimmings from grapes, and of the woody residues of the hemp industry. The hydrolysis was carried out with various concentrations of H_2SO_4, HCl, HNO_3. Products were obtained containing approximately 30 per cent of reducing sugars, 45–50 per cent of soluble substances, and 60–70 per cent of free cellulose.—*A. Bonazzi.*

51. Scurti, F., e V. Vezzani. **Sull'impiego delle materie legnose per l'alimentazione del bestiame. [The use of woody substances for the feeding of animals.]** Staz. Sper. Agrar. Ital. 55: 24–33. 1922.—Palatability trials of the products obtained by the acid hydrolysis of corn cobs and straw, i.e., cake and syrup, were conducted with cows, pigs, rabbits, and chickens; all the animals relished these food substances.—*A. Bonazzi.*

52. Smerle, G. **Improvement of Phormium tenax for the fibre industry.** New Zealand Jour. Agric. 36: 363–370. *4 fig.* 1923.—A study of the yellow leaf disease of *Phormium* in New Zealand shows that the disease is increased, the health and vigor of the plants injured, the quality of the fiber damaged, and the quantity of leaves and percentage of fiber in the leaf reduced by the present method of cutting too closely, by grazing, and by weeds. Twenty-three strains or varieties of *Phormium* were grown and tested, showing a marked difference in resistance to disease and a range from 2.5 to 18.8 per cent in yield of finished fiber.—If the leaves are cut diagonally on each side of the fan-like cluster at about the point where they separate and 2–3 leaves are left with the central shoot between them, instead of cutting the entire cluster level and close, as is the common practice, the plants recover much more quickly. From the experimental results it is estimated that the best varieties kept free from weeds and properly cut will yield more than 5 times the present average production of fiber per acre. Improvement of *Phormium* by plant breeding methods is urged.—*Lyster H. Dewey.*

53. Sparks, G. C. **Farmers experiments plots. Wheat, oat and barley experiments, 1922. Southern district.** Agric. Gaz. New South Wales 34: 395–405. *2 fig.* 1923.—Experiments were conducted cooperatively upon 23 private farms. Brief notes on character of soil and methods and times of cultivation together with amount of fertilizer and rainfall are given. The season was generally drouthy. The new wheat variety Waratah yielded remarkably well and is promising for the southern district. Manurial trials furnished additional evidence of the futility of growing wheat in the Riverina and southwestern slopes without superphosphates. Results indicate that the present standard of 56 pounds superphosphate per acre is practically correct. Two new varieties of oats, Quondong and Mulga, outyielded the standard Algerian variety by 50 per cent in the southern district. Details are given of a summer fallow experiment.—*L. R. Waldron.*

54. Waldron, L. R., and T. E. Stoa. **Winter wheat in North Dakota.** North Dakota Agric. Exp. Sta. Bull. 169. *12 p., 1 fig.* 1923.—Winter wheat in North Dakota is generally unsuccessful as indicated by experiments giving negative results at different points in the state. A few farmers report successful winter wheat culture when "stubbled in" under proper conditions.—*L. R. Waldron.*

55. Ward, F. E. **Regrassing experiments on Canterbury back country.** New Zealand Jour. Agric. 36: 358–362. *5 fig.* 1923.

56. Wenholz, H. **Green manuring.** Agric. Gaz. New South Wales 34: 526–527. *3 fig.* 1923.—Instructions are given in regard to methods of plowing under green manuring crops.—*L. R. Waldron.*

57. Wenholz, H. **Growing maize provides feed for sheep.** Agric. Gaz. New South Wales 34: 470. *1 fig.* 1923.—Three hundred sheep were pastured on 25 acres of corn before harvesting. The corn yielded 90 bushels per acre after being pastured by sheep.—*L. R. Waldron.*

58. Werba, K. **Düngungsversuche mit neuzeitigen Kunstdüngmitteln. [Experiments with new artificial fertilizers.]** Wiener Landw. Zeitg. 73: 50. 1923.—A synthetic urine fertilizer failed to give results when applied to barley and sugar beets equal to those produced by ammonium sulphate and a double nitrate and sulphate of ammonia.—*F. Weiss.*

59. White, H. G. **Cowpeas for green manure.** Agric. Gaz. New South Wales 34: 492. *1 fig.* 1923.—At Narara cowpeas were planted Dec. 12 and plowed under Mar. 12. It is estimated that the crop plowed under weighed over 33 tons per acre. Rainfall during growth amounted to about 6 inches.—*L. R. Waldron.*

60. Whittet, J. N. **The success of elephant grass in the recent dry season.** Agric. Gaz. New South Wales 34: 388–390. *2 fig.* 1923.—*Pennisetum purpureum* has been found to make remarkable growth under drouth conditions. At Richland with approximately 25 per cent of normal precipitation, 1 acre of elephant grass planted in hills 3 feet apart made sufficient growth to pasture on an average over 30 cows for three 1-week periods during 7 months. The grass made still another recovery. At Lismore, after having attained a height of 12 feet, the grass was cut and left on the ground. New growth started immediately and continued vigorously during a dry period. The carrying capacity of this area was estimated to be 1 animal unit to the acre.—*L. R. Waldron.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 40, 85, 107, 114, 173, 179, 188, 207, 370, 379, 396, 532, 545)

61. Anonymous. **Referater af fremmed Litteratur.** [References to foreign literature.] Tidsskr. Planteavl **29**: 160–168. 1923.—Short summaries of results of important foreign work on agriculture are presented.—*Albert A. Hansen.*

62. Anonymous. [Rev. of: Singer, Charles. **Greek biology and Greek medicine. Chapters in the history of science, I.** *[iv] + 128 p., 10 pl.* Clarendon Press: Oxford, 1922 (see Bot. Absts. 13, Entry 83). Nature **110**: 631. 1922.

63. B., S. P. **Pasteur's scientific career.** [Rev. of: Descour, L. **Pasteur and his work.** Translated from the French by Wedd, A. F., and B. H. Wedd. *256 p.* T. Fisher Unwin: London, 1922 (see Bot. Absts. 13, Entry 70). Nature **109**: 805–806. 1922.

64. Chamberlain, Edward B. **The British Bryological Society.** Bryologist **26**: 30–31. 1923.—An account of the reorganization of the Moss Exchange Club of Great Britain, a list of the officers, and an abstract of the membership rules are given.—*E. B. Chamberlain.*

65. Cheshire, F. J. **Some Abbé letters.** Jour. Roy. Microsc. Soc. London **1923**: 163–170. *Fig. 1–6.* 1923.—Two letters from E. Abbé to John Ware Stephanson, dated 1878, are presented, in which he discusses principally the subject of "numerical aperture," as applied to his new homogeneous-immersion objective.—*R. E. Cleland.*

66. Christensen, C. **Botanik i Danmark i det 17. Aarhundrede.** [**Botany in Denmark in the 17th century.**] Nat. Verden **5**: 145–168, 355–374. *9 fig.* 1921.

67. Christensen, C. **Dansk botanisk literatur i 1918, 1919, 1920.** [**Danish botanical literature, 1918, 1919, 1920.**] Bot. Tidsskr. **37**: 337–362. 1922.

68. Christensen, C. **Otto Friderich Müller specielt som Botaniker.** [**Otto Friderich Müller, particularly as a botanist.**] Nat. Verden **6**: 49–68. *Portrait.* 1922.

69. Derrien, E. **Pasteur et la chimie biologique.** [**Pasteur and biological chemistry.**] Bull. Soc. Biol. Chim. **5**: 155–176. 1923.—This lecture was delivered at the meeting of the Society of Biological Chemistry at the Pasteur Institute, Dec. 19, 1922, in commemoration of the centenary of Pasteur.—*Joseph S. Caldwell.*

70. Descour, L. **Pasteur and his work.** [Translation by Wedd, A. F., and B. H. Wedd. *256 p., Portrait.* T. F. Unwin: London; Frederick A. Stokes Co.: New York, 1922.—This is an account of Pasteur's researches, reviewing his methods and conclusions in comparatively non-technical language. [See also Bot. Absts. 13, Entry 63.]—*C. W. Dodge.*

71. Fabricius. **Dr. Karl Wimmenauer.** Forstwiss. Centralbl. **45**: 241–243. 1923.—This is an account of the life and work of the distinguished forestry investigator and teacher, who died on Feb. 10, 1923.—*W. N. Sparhawk.*

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73. Gibson, R. J. Harvey. **The age of the herbalists 1500–1560 A. D.** Pharm. Jour. **109**: 435–437. 1922.—This is the 2nd of 4 lectures and covers Brunfels, Bock (Tragus), William Turner, Valerius Cordus, Dodoens, de l'Escluse (Clusius), L'Obel, Gerard, Parkinson, and Cesalpino.—*E. N. Gathercoal.*

74. Haberlandt, G. **Das Pflanzenphysiologische Institut der Universität Berlin.** [**The plant physiological institute of Berlin University.**] Beitr. Allg. Bot. **1**: *i–xi. Pl. 1, fig. 1–5.* 1918.—A description is given with an illustration and plans of the new institute for plant physiology dedicated May 20, 1915. The new journal, Beiträge zur Allgemeinen Botanik, was established primarily by Haberlandt to publish results of the work done in this institute.—*Orton L. Clark.*

75. Harms, H. Georg Schweinfurths Forschungen über die Geschichte der Kulturpflanzen. [Georg Schweinfurth's researches on the history of cultivated plants.] Naturwissenschaften 10: 1114–1116. 1922.

76. Haskell, R. J. International conference of phytopathologists in Holland, June 25–30, 1923. Phytopathology 13: 287–288. 1923.—An outline program of the meeting is given.—*B. B. Higgins.*

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78. Maxwell, Herbert. Nature knowledge and pastime. [Rev. of: Coates, H. A Perthshire naturalist: Charles Macintosh of Inver. With a chapter on Scottish folk-music by A. Wiseman. *xx + 244 p., 32 pl.* T. Fisher Unwin; London, 1923.] Nature 111: 800–802. 1923.

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80. Read, Anne Lauriat. Moss study in the New England Women's Club of Boston. Bryologist 26: 29. 1923.—For over 40 years a portion of the program of the Botany Group of the Womens Club has been regularly given over to moss study.—*E. B. Chamberlain.*

81. Savastano, L. Contributo allo studio critico degli scrittori agrari Italici. Giovanni Pontano, Antonino Venuto e Gregorio dei Cormo. [Contribution to the critical study of Italian agricultural writers.] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale 6: 77–117. *Fig. 1.* 1922.—This study of the Hesperidium of G. Pontano, the Opusculum of A. Venuto and the poems of G. dei Cormo points out the agricultural practices of the time, disentangling them from the poetical form of these didactic verses.—*A. Bonazzi.*

82. S[chaeffer], A. Louis XV, forestier. [Louis XV, forester.] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est 15: 14–16. 1923—An extract is given from a letter dated 1724 and signed by Louis XV, in regard to the abuse and degeneration of the forests of the Province of Dauphiné. "It is necessary that these disorders on the part of private owners be discontinued."—*J. Kittredge, Jr.*

83. Singer, Charles. Greek biology and Greek medicine: Chapters in the history of science I. *[iv] + 128 p., 10 pl.* Clarendon Press: Oxford, 1922. 2s. 6d.—This is a reprint of The Legacy of Greece, R. W. Livingstone, Editor [see Bot. Absts. 12, Entry 151], with a new section dealing in some detail with the biological works of Aristotle. [See also Bot. Absts. 13, Entry 62.]—*C. W. Dodge.*

84. Tutton, A. E. H. Pasteur in crystallography. Nature 110: Suppl. viii. 1922.

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 48, 49, 70, 80, 81, 83, 105, 136, 173, 175, 179, 203, 276, 353, 377, 404)

85. Anonymous. Det kgl. danske Landhusholdningsselskabs Laerlingeinstitution. [The Royal Danish Agricultural Society's Apprentice School.] Tidsskr. Landokonomi 4: 174–191. 1923.—An historical account and résumé of the work accomplished in the agricultural school established by the Royal Danish Agricultural Society is given.—*Albert A. Hansen.*

86. Graves, Arthur Harmount. Some September flowers at the Garden. Brooklyn Botanic Garden Leaflets 11^7: 1–4. 1923.—This comprises descriptions of cannas, heaths, heather, four o'clocks, and perennial asters, from a morphological as well as a horticultural standpoint.—*A. H. Graves.*

87. Sartory, A. et R. Benoist. La pratique des prélèvements bacteriologiques, biologiques, chemiques et industriels. [The practice of bacteriological, biological, chemical and industrial preliminary diagnoses.] *266 p., 32 fig.* Librairie le François: Paris, 1918.

88. Sinnott, Edmund W. Botany: principles and problems. *xix + 385 p., 240 fig.* McGraw-Hill Book Co.: New York and London, 1923.—This is a text for a college course in elementary botany, setting forth the more important facts of morphology, physiology, and

classification of plants. The Questions for Thought and Discussion at the end of each chapter are a new feature for this type of textbook. The first part of the book deals with the seed plants, and after introductory chapters, chapter 3 is devoted to the soil and its importance; chapters 4, 5, and 6 to the structure and functions of the vegetative organs; chapters 7–12 to metabolism, growth, the plant and its environment, reproduction, heredity and variation, and evolution; and chapters 13–17 deal more especially with the general morphology and classification of the whole plant kingdom, discussing successively Thallophyta, Bryophyta, Pteridophyta, and Spermatophyta.—*A. H. Graves.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 65, 171, 256, 259, 288, 355, 378, 404, 466, 496)

ECOLOGY AND PLANT GEOGRAPHY

George D. Fuller, *Editor*

(See also in this issue Entries 12, 25, 75, 115, 138, 161, 203, 256, 260, 264, 265, 266, 267, 390, 392, 485, 486, 494, 542, 543, 599)

FLORISTICS

89. Buchanan, Margaret A. **Some botanical features of western Canada.** Pharm. Jour. 109: 230–231. 1922.—The flora of Western Canada may be thought of as of 2 distinct types; the alpine flora of the higher Rockies and Selkirks, which lie between the Rockies and the Pacific coast, and the lowland flora, including that of Vancouver Island, where humidity abounds and the climate is temperate and plants become very large. Special mention is made of the forests of giant conifers (Douglas spruce, western hemlock, giant cedar), *Echinopanax horridum*, arbutus or strawberry tree, lupines, columbines, larkspurs, *Cytisus scoparius*, *Spiraea*, *Symphoricarpos*, *Castilleja*, *Sambucus* species, *Lysichiton kamtschatcense*, and many others.—*E. N. Gathercoal.*

90. Lyle, L. **Distribution of the marine flora of the Channel Islands compared with that of the coasts of western Europe.** Jour. Ecology 11: 77–92. 1923.—The species of marine Algae known to occur on the coasts of the Channel Islands are given in tabular form and their distribution on the other European coasts indicated.—*Geo. D. Fuller.*

91. Merrill, E. D. **Distribution of the Dipterocarpaceae. Origin and relationships of the Philippine flora and causes of the differences between the floras of eastern and western Malaysia.** Philippine Jour. Sci. 23: 1–32. *Pl. 1–8.* 1923.—A general consideration is presented of the geographic distribution of the characteristic Indo-Malaysian family Dipterocarpaceae, the individual species of which are dominant in the primary forests of the eastern tropics, with special reference to the relationships of the Philippine flora with those of both eastern and western Malaysia, correlated with the geologic history of Malaysia, as outlined by Molengraaff. Briefly the conclusions are that in Malaysia there are 2 stable areas now delimited by the Asiatic and Australian continental shelves, the limits of which are taken to be represented by the present 200 m. isobath. During the Pleistocene, Sumatra, Java, Borneo, and Palawan formed a partof the Asiatic continent, and New Guinea formed a part of Australia. Between these two ancient, more or less stable continents, called Sundaland and Papualand, is found an unstable orogenetically still active region, consisting of the Lesser Sunda Islands, Celebes, the Moluccas, and the Philippines, in which intermigrations of both plants and animals have been limited by constant archipelagic conditions since the early Tertiary. There is no sharp biogeographic boundary in the entire region, but Wallace's Line marks the approximate position to the west where the unstable insular area infringes on the old stable continent, and Weber's Line marks the corresponding eastern boundary where the unstable insular area impinges on the old

stable Papuan continent. Two centers of origin and dispersal, Sundaland and Papualand, one to the west and one to the east, have supplied elements of both the fauna and the flora to the Lesser Sunda Islands, Celebes, the Moluccas, and the Philippines; as a result the Philippines presents an admixture of western Malaysian and eastern Malaysian types, with a distinctly strong Australian element, the latter much stronger in the Philippines than in western Malaysia. These eastern Malaysian and Australian elements, although many of them reach northern Luzon, fail to reach Formosa, corroborative evidence that the Bashi Channel between Formosa and the Philippines is an ancient break (Early Tertiary.) The intermittent connections between the Philippines and the islands to the southwest, south, and southeast have not been more than relatively narrow isthmuses since the Cretaceous. Within the intermediate unstable insular area, the lines of elevated islands and corresponding great deeps do not extend east and west across the entire region, but extend in a general north and south direction or curve sharply to the north at their eastern extremeties, thus indicating general north and south land connection, rather than direct east and west ones. The geographic distribution of both plants and animals is in conformity with these data. As to the Philippines, it is concluded that its floristic alliances are stronger with western than with eastern Malaysia because in considering all the genera of Malaysian flowering plants it is found that of about 356 occurring in western but not in eastern Malaysia, 218 or 61 per cent occur in the Philippines, while of the 255 genera occurring in eastern but not in western Malaysia, 56 or about 25 per cent occur in the Philippines, thus indicating longer and more pronounced land connections between the Philippines and western Malaysia than between the Philippines and eastern Malaysia.—*E. D. Merrill.*

92. Palmgren, Alvar. **Über Artenzahl und Areal, sowie über die Konstitution der Vegetation: eine vegetationsstatistische Untersuchung. [On enumeration and areal distribution of species, and on the constitution of vegetation: a statistical investigation of vegetation.]** Acta Forestalia Fennica 22. *vii + 136 p., 2 pl., 8 tables, 2 maps.* 1922.—A translation of part III of the author's previous work, "Studier öfver löfängsområdena på Åland." (I. Vegetationen, II. Floran, III. Statistisk undersökning af floran. 1915–1917.) The aim is not confined simply to a description of the vegetation of the Aland islands, but to utilize the peculiar advantages presented by this archipelago as a well-marked series of geographical units, in a really exact study of the frequency of occurrence and density of distribution of the species that constitute their plant population. General studies were conducted over the entire archipelago, and certain small "special regions" (islets, or parts of larger islands, 30 in all, arranged into 5 geographical districts) were selected for intensive examination. Tables present the data of occurrence of species according to their total number in each of the districts; as percentage-representations in the total species-number for the islands (324): the richest region has 256 (79 per cent); the poorest has 143 (44.1 per cent)); they also show, as subdivisions, relative abundance of woody species, grasses and other herbaceous species. The tables show: (1) approximately equal numbers of species in isolated special regions of approximately the same size and of similar ecological character; (2) a correlation between the area of a district and the number of species it contains; hence it follows (3) that the vegetation of the special regions (at least) represents a fairly definite state of equilibrium, and (4) that a certain definite relationship exists between the area of a region and the number of species occupying it. Of the 324 spp. found in the islands, only 52 (16 per cent) are found in all 30 of the special regions; only 193 (59.6 per cent) in more than half of them. Check-lists are given for each of the five districts into which the special regions are grouped, and the frequency relations of species within them are tabulated. In a given district, each special region contains about half of all the species represented in the whole district. The relative number of species common to all the special regions is fairly constant for the districts taken as wholes—about one-third of the total number in each case. The special regions in each district are compared, in adjacent pairs, for common elements in their flora; correspondence ranges from 70 to 100 per cent. Probable paths of migration are discussed and charted. The emergence of the islands is recent, and evidence points to rapid migrations. Most of the plant formations show no uniformity in composition; they are apparently not yet fully developed.—*Frank Thone.*

93. Palmgren, Alvar. **Zur Kenntnis des Florencharakters des Nadelwaldes: eine pflanzengeographischie Studie aus dem Gebiete Ålands.** [Contribution on the floristic character of the conifer forest: a phytogeographical study in the Aland region.] Acta Forestalia Fennica 22. *114 p., 1 map.* 1922.—A floristic study of the conifer forests of the Aland Islands is here undertaken, as a type of plant population of sterile soils. Most of the area of the islands is covered with pine and spruce forests, in both pure and mixed stands. In poverty of species, the flora of the conifer forests contrast sharply with the richer middle-European deciduous forests, whose outposts occupy part of the same archipelago. There are only 5 tree species: *Taxus baccata*, *Pinus silvestris*, *Picea Abies*, *Juniperus communis* and *Daphne Mezereum*. Undergrowth shrubs, also 5 in number, all heath plants: *Empetrum nigrum*, *Arctostaphylos uva-ursi*, *Vaccinium vitis-idaea*, *V. Myrtillus*, and *Calluna vulgaris*. There are 50 herbaceous species, of which 12 are pteridophytes. Only part of these are limited to conifer forests, notably the heath plants, *Equisetum*, *Lycopodium*, *Chimaphila*, *Pyrola*, *Linnaea*, etc. The idea of forest-types distinguished by undergrowth characters (e.g. "*Oxalis*-type," "*Myrtillus*-type," "*Calluna*-type," etc.) is reviewed. The forests of Aland are mostly of the *Calluna* and *Vaccinium* types, with some *Myrtillus*-type; the *Oxalis-Myrtillus*-type represents the highest development. The *Calluna*-type is mainly characteristic of pine woods, and excludes almost all other undergrowth, admitting occasional invasions of *Empetrum*, *Arctostaphylos*, *Vaccinium*, etc. The *Vaccinium*-type, characterized by *Vaccinium vitis-idaea*, is more tolerant of neighbors, admitting all of the species of the *Calluna*-type as well as a larger number of herbaceous species. The *Myrtillus*-type, dominated by *Vaccinium Myrtillus*, belongs to the spruce forests. It comprises 36 species, as against 27 for the *Vaccinium*-type. The *Oxalis-Myrtillus*-type has an even richer development, containing 52 species; its list includes most of the species that occur in the conifer forests at all. *Spergula* and *Sanicula* types are also described. Detailed consideration is given to the areas of virgin forest. Where there has been no fire, cutting or grazing, extensive areas under the trees are dominated by a moss (*Hylocomium*) or lichens (*Cladonia* spp.) This indicates that the "types" here considered are mainly secondary developments. The conifer forests possess 18 species which the deciduous forests do not have, notably the heather-plants and pteridophytes, with *Spergula*, *Chimaphila*, *Pyrola* and *Linnaea*. Thirty-three species, including all the constituent conifers, are common to both forests. There is close correspondence between the floras of the islands and those of the Finnish mainland. A summary list of species is presented, with notes on the localities where each occurs.—*Frank Thone.*

94. Praeger, R. Lloyd. **Dispersal and distribution; Presidential address.** Jour. Ecology 11: 114–123. 1923.—This contains a review and discussion of the theories and facts of plant distribution.—*Geo. D. Fuller.*

95. T[ansley], A. G. **History of the "Scots pine" in England.** [Rev. of Bloomer, H. H. **The presence of Scots pine (P. silvestris) in Sutton Park, Warwickshire.** Proc. Birmingham Nat. Hist. and Phil. Soc. 15: Pt 1. (Supplement) 1923.] Jour. Ecology 11: 128. 1923.—This is evidence that the tree was native to the location hundreds of years ago.—*Geo. D. Fuller.*

GENERAL, CONDITIONS, MEASUREMENTS

96. Anonymous. **Soil acidity and plant distribution.** [Rev. of: Olsen, Carsten. **Studies on the hydrogen ion concentration of the soil and its significance to the vegetation, especially to the natural distribution of plants.** Compt. Rend. Lab. Carlsberg 15[1]: 1–166. 1923 (see Bot. Absts. 12, Entry 3825).] Nature 111: 791–792. 1923.—This investigation on the vegetation of Danish soils is regarded as very thorough.—*O. A. Stevens.*

97. Bailey, John W. **The passing of our forest mosses.** Bryologist 26: 20–22. *Pl. 2–3.* 1923.—Abundant moisture, absence during much of the year of bright sunshine, and freedom from frosts, originally produced an exceedingly rank moss vegetation along the northwest American coast. Lumbering and the subsequent fires have brought exposure to direct sunlight and the destruction of the humus. The consequent rapid erosion has filled the formerly clear streams with mud, and settlement and cultivation have introduced the competition of grasses and weeds. As a result within 2 decades most species of characteristic forest mosses,

once common even near and in the towns, have become decidedly uncommon. Draining of swamps and bogs for cultivation has still further reduced the number. At the same time the pollution of the atmosphere through smoke and gases has destroyed the arborescent mosses, which find no opportunity for germination. The ground inhabiting mosses seem less susceptible to atmospheric conditions, since they tend to return when shade and moisture are present. The plates show vividly the changes from primeval forest to cultivated land.—*E. B. Chamberlain.*

98. Braid, K. W. **The measurement of light for ecological purposes.** Jour. Ecology **11:** 49–63. 1923.—A critical examination is made of various photographic and photochemical methods that have been used for measuring light. The conclusion is reached that darkening of sensitized paper gives the best result but that the errors are greater than was claimed by Wiesner. The need of standardizing photometers to a known standard is emphasized.—*Geo. D. Fuller.*

99. Buckle, Philip. **On the ecology of soil insects on agricultural land.** Jour. Ecology **11:** 93–102. 1923.—This includes some notes on the plants affected by the insects.—*Geo. D. Fuller.*

100. Evans, E. Price. **Carrington Moss, with special reference to the weeds of arable ground.** Jour. Ecology **11:** 64–77. *2 fig.* 1923.—The area studied was reclaimed peat bog on which night-soil and street sweepings had been dumped. Lists of dominant, frequent, occasional and rare weeds are given as they are associated with various crops. H-ion tests showed the soil of the uncultivated Moss to be very acid, that of the cultivated areas less so.—*Geo. D. Fuller.*

101. Hamel, G. **Sur la limite de la végétation dans la Manche, d'après les dragages effectués par le "Pourquoi-Pas?" [On the lower limit of vegetation in the English Channel as found by the dredgings of the boat, Pourquoi-Pas?]** Compt. Rend. Acad. Sci. Paris **176:** 1568–1570. 1923.—A record is given of the depths at which different species of algae were found in 39 dredgings in August and September, 1921. The dredgings were made between 15 to 150 m. in depth at various points near the western end of the channel; 32 species of algae are listed, including 25 Rhodophyceae, 5 Phaeophyceae, and 1 Chlorophyceae, namely, *Ostreobium Queketti*, found 15–30 m. down. A discussion is given of the maximum depth of algae. Savageau found them in the Mediterranean to a depth of 200 m;. in the channel none are found below 45 m.—*C. H. Farr.*

102. Kimball, Herbert H., and Herman E. Hobbs. **A new form of thermoelectric recording pyrheliometer.** Monthly Weather Rev. **51:** 239–242. *4 fig.* 1923.

103. McCrea, R. H. **Light intensity measurement by means of hydriodic acid.** Jour. Ecology **11:** 103–112. *3 fig.* 1923.—A critical study of several factors involved leads to the conclusions that the rate of decomposition of a solution of potassium iodide and dilute acid is proportional to the light intensity, that the solution is sensitive mainly to blue light, that the rate of the reaction depends largely on the concentration of the acid, that the rate is also influenced by the concentration of potassium iodide, and that the decomposition appears to be a first order reaction. Suggestions are made for the use of this method in ecology.—*Geo. D. Fuller.*

104. Markgraf, Fr. **Vegetationsstudien in den Wäldern Ostpreussens. [Studies on the vegetation in the forests of East Prussia.]** Naturwissenschaften **11:** 268–274. 1923.

105. T[ansley], A. G. **Plant life of the Oxford district.** [Rev. of: Church, A. H. **Introduction to the plant life of the Oxford district.** Oxford Bot. Mem. 13. *103 p., 15 pl.* 1922.] Jour. Ecology **11:** 128. 1923.—"Packed with interesting facts, very well documented and for the most part shrewd and penetrating. It should serve for an excellent foundation for genuine ecological study of their neighborhood by Oxford students."—*Geo. D. Fuller.*

VEGETATION

106. Watt, A. S. **On the ecology of British beechwoods with special reference to their regeneration.** Jour. Ecology **11:** 1–48. *2 fig.* 1923.—Investigating the fact that in Great Britain the regeneration of *Fagus silvatica* is notably poor, the literature on the subject is

reviewed and as the result of experiments the conclusions are reached that deep shade affects the vigor of the seedlings and makes them more likely to succumb to the attacks of insects and fungi, that the entire absence of shade permits *Rubus* to become so luxuriant as to hinder or prevent the growth of beech seedlings, that many seedlings are destroyed by insects and fungi, that small vertebrates, especially mice and wood-pigeons, destroy practically all the fruit except when a very heavy crop is produced and hence that regeneration is limited to the apparently sporadic occurrence of years of full mast.—*Geo. D. Fuller.*

FOREST BOTANY AND FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 47, 48, 71, 82, 91, 93, 95, 97, 104, 106, 212, 258, 299, 301, 305, 308, 320, 321, 326, 366, 484, 572, 573, 574, 577, 595, 605, 617)

107. Anonymous. **Délits forestiers en 1817.** [Forest damages in 1817.] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est 15: 16–18. 1923.—An inspection report of 1817 describes excessive cuttings near Pontarlier.—*J. Kittredge, Jr.*

108. Anonymous. **Our future hardwood supply.** North Carolina Geol. and Economic Surv. Press Bull. 171. *6 p.* 1920.—This bulletin discusses the importance of the hardwood forests of the Southern Appalachian States in relation to the industries of the South.—*C. F. Korstian.*

109. Anonymous. **Report on the Botanical and Forestry Department (Hong Kong, China) for the year of 1920.** *19 p.* 1921.—This is a collection of notes dealing with the work in the botanical gardens and various grounds and nurseries in charge of the superintendent. Forestry activities include the formation and care of pine and broadleaved plantations, their protection from fire, the work of forest guards, the planting and care of roadside trees, miscellaneous planting, the repair of roads and paths, the clearing of undergrowth for anti-malarial purposes, and the granting of forestry licenses and permits. *Pinus Massoniana* was the pine chiefly planted. The broadleaved trees were chiefly *Casuarina, Callistemon, Poinciana, Erythrina,* and *Tristania.* The seeds of some American trees were sown in the nursery, viz: *Cupressus macrocarpa, Pinus radiata, P. echinata, P. ponderosa sepulorum* [*scopulorum?*]. Tables are appended dealing with the rainfall for the year, offenses against the forestry laws, expenditures on the nurseries, revenues, and the comparative revenue and expenditure for the year. The rainfall was about 124 inches or 50 per cent above normal. It comes mostly during the spring and summer. In 1920 the revenue was 15 per cent of the expenditures. Forestry licenses and timber sales furnish the bulk of the income. The principal offenses were stealing pine branches, needles, and brushwood.—*Richard H. D. Boerker.*

110. Anonymous. **Report on the Botanical and Forestry Department (Hong Kong, China) for the year 1921.** *19 p.* 1922.—The report deals with the activities in connection with the botanical gardens and various grounds and nurseries in charge of the superintendent. Forestry activities include the planting and sowing of *Pinus Massoniana;* the planting of a number of broad-leaved species, chiefly *Tristania, Eucalyptus,* and *Artocarpus;* the care of plantations; their protection from fire; the work of forest guards; the planting and care of roadside trees; miscellaneous planting; the repair of roads and paths; the clearing of undergrowth for anti-malarial purposes; and the granting of forestry licenses and permits. A number of trees of *Anona reticulata* imported from Macao produced fruit which commands a good price. Bananas are now well established. A variety of *Citrus medica* was also introduced. Several consignments of *Ficus retusa* containing insects were sent to the Entomologist of the Forestry Department, Honolulu, where the insects were to be liberated to assist in the fertilization of wild or planted varieties of *Ficus.* As the pollen from *Ligustrum sinense* causes severe hay fever this species should be eliminated from certain districts. Tables deal with the year's rainfall, offenses against the forestry laws, expenditures on the nurseries, revenues, and the comparative revenue and expenditure. The rainfall was about 108 inches, considerably above the normal. In 1921 the revenue was over 17 per cent of the expenditures, being the highest on record. Forestry licenses and timber sales furnished the bulk of the income. The principal offenses are stealing brushwood, pine needles, branches, and trees.—*Richard H. D. Boerker.*

111. Baltz, Carl. **Stieleiche und Traubeneiche.** [**Quercus pedunculata and Q. sessiliflora.**] Deutsch. Forstzeitg. **38**: 501–503. 1923.—The writer warns against extensive planting of oak on the pine lands of northern Germany. Although some hold the 2 oaks to be 1 species, they are quite different, and the sessile oak will grow on much poorer sites. It is difficult to get from dealers acorns known to be exclusively of either species.—*W. N. Sparhawk.*

112. Bray, M. W., and T. W. Andrews. **An improved method for the determination of alpha-, beta-, and gamma-cellulose.** Indust. and Eng. Chem. **15**: 377–378. 1923.—The details are given for an improved method for determining alpha, beta, and gamma cellulose, based upon the titration of organic material in Cross and Bevan cellulose. It is more accurate and can be carried out more rapidly than the gravimetric method.—*Henry Schmitz.*

113. Bray, M. W., and J. A. Staidl. **The chemical changes involved during infection and decay of wood and wood pulp.** Jour. Indust. and Eng. Chem. **14**: 35–40. 1922.—Infected woods produce less pulp per unit weight of wood than sound woods. Infected woods are inferior to sound woods because: (1) they contain a larger percentage of substances soluble in cold or hot water; (2) the percentage of alkali-soluble substance is greater; (3) the copper number is higher; and (4) the percentage of alpha or stable cellulose is lower.—*Henry Schmitz.*

114. Bühler, A. **Der Waldbau, nach wissenschaftlichen Forschung und praktischer Erfahrung.** [**Silviculture based upon scientific investigation and practical experience.**] Vol. II. *679 p.* E. Ulmer: Stuttgart, 1922.—The practice of silviculture and the history of silvicultural practice and silvicultural science are covered. Under the first head are considered the utilization and care of the forest soil; the use of the different tree species in management; natural and artificial reproduction; the care and protection of stands; and various systems of silvicultural management. Many diagrams and tables are included. The historical treatment of the important branches of silviculture and the complete bibliographies are features. [For Vol. I, see Bot. Absts. 10, Entry 1012.]—*Richard H. D. Boerker.*

115. C. [Rev. of: Osmaston, A. E. **Notes on the forest communities of the Garhwal Himalaya.** Jour. Ecology **10**: 129–167. 1922 (see Bot. Absts. 12, Entry 3027).] Indian Forest. **49**: 387–389. 1923.—"A reader whose interest is primarily in forestry as opposed to pure botany will conclude perusal with thought that an exhaustive study of ecological conditions affecting any of the species which form important forest crops would be of more value to him, but it may be asserted that an adequate comprehension of the whole should precede the detailed investigation of the part."—*E. N. Munns.*

116. C., F. [Rev. of: Sweet, C. V. **Further experiments in the air seasoning of Indian timbers and general recommendations as to seasoning methods.** Indian Forest Rec. **9**[5]: 147–226, 241–288. 1923 (see Bot. Absts. 12, Entry 6309).] Indian Forester **49**: 380–387. 1923.

117. Chapman, H. H. **Forest taxation.** North Carolina Geol. and Economic Surv. Press Bull. 174. *11 p.* 1920.—This is a semi-popular presentation of the need for reform in forest taxation.—*C. F. Korstian.*

118. Chavastelon, R. **Sur un procédé de conservation des bois.** [**On a process for the preservation of wood.**] Compt. Rend. Acad. Sci. Paris **176**: 1178–1179. 1923.—A copper chromate solution is recommended.—*C. H. Farr.*

119. Clark, W. Darrow. **Forest warden's manual.** *23 p.* North Carolina Geol. and Economic Surv.: Chapel Hill, 1922.—This is a handbook of instructions and information useful to forest wardens.—*C. F. Korstian.*

120. Clark, W. Darrow. **The forest problem in North Carolina.** North Carolina Geol. and Economic Surv. Circ. 1. *14 p.* 1922.—This circular discusses the importance of the forests of North Carolina and the need for fire protection.—*C. F. Korstian.*

121. Endres, G. **Eine Lanze für die Eichenwirtschaft in Hochspessart.** [**A defense of the treatment of oak stands in the upper Spessart.**] Forstwiss. Centralbl. **45**: 201–218. 1923.—The author, who spent his boyhood and 35 years of active forestry work in the Spessart forest (Bavaria), criticises statements and conclusions of Rebel in the book "Waldbauliches aus Bayern," and explains the reasons for the various methods which Rebel condemns.—*W. N. Sparhawk.*

122. Endres, G. **Pflanzungen an Waldstrassen.** [**Planting along forest roads.**] Forstwiss. Centralbl. **45**: 153–154. 1923.—Suggestions are made regarding species to plant and

methods of planting. It is important to let light and air reach the road, especially in spring, fall, and winter, so that the surface will be dry and hard.—*W. N. Sparhawk.*

123. Eulefeld. **Etwas vom Durchforsten.** [**Concerning thinnings.**] Deutsch. Forstzeitg. **38**: 330–331. 1923.—Kohler has recommended that thinnings be made so as to allow the crowns of the remaining trees to have a width $\frac{1}{6}$ the height of the trees, and Gehrhardt suggests varying the ratio according to site. Because of the difficulty of estimating heights and crown widths in closed stands, this method is not easy to apply. Eulefeld has obtained excellent results by thinning so that the spacing of the tree in m. equals $\frac{1}{2}$ the number of decades in their age. Trees in the 100-year class, for instance, should stand 5 m. apart.—*W. N. Sparhawk.*

124. Fabricius. [Rev. of: Reischle, Rudolph, und Paul Wachter. **Energiewirtschaft in statistischer Beleuchtung. Band I. Energievorräte und ihre Gewinnung.** (**Statistics of power resources. Vol. 1. Sources of energy and its production.**) *58 p. 29 fig.* Johs. Albert Mahr: Munich, 1922.] Forstwiss. Centralbl. **45**: 194–196. 1923.—Sources of energy,—coal, peat, wood, oil shale, petroleum, natural gas, and water power,—are discussed. Germany's total wood stock has been estimated by Flügel at 2,100 million tons, figuring 0.6 ton per cubic m. This would not go very far in supplying the country's fuel requirements if it were the sole source of energy.—*W. N. Sparhawk.*

125. Fabricius. [Rev. of: Wiedemann, Eilhard. **Zuwachsrückgang und Wuchsstockungen der Fichte in den mittleren und unteren Höhenlagen der sächsischen Staatsforsten.** [**Decreased increment and growth-stagnation of spruce at middle and lower altitudes on Saxon state forests.**] *180 p.* W. Laux: Tharandt, 1923.] Forstwiss. Centralbl. **45**: 232–237. 1923. —This most thorough and carefully executed study is exceedingly instructive and stimulating, and should be of interest to all who have to deal with spruce forests, with clear-cutting in pine or spruce, or with deterioration of soil under any species of timber.—*W. N. Sparhawk.*

126. Fabricius, L. **Brennholzerzeugung und Heizstoffnot.** [**Firewood production and fuel shortage.**] Forstwiss. Centralbl. **45**: 161–169. 1923.—In 1913 the total German wood production covered by statistics was 58,477,273 cubic m., of which 29,813,625 cubic m. was firewood. Allowing for reduction in forest area, and a small amount of branch-wood not used for fuel, the present firewood production is 25,203,025 cubic m. In addition, there is considerable fagot-wood and the like not covered by statistics, as well as wood cut from roadside, park, and fruit trees. Practically all of the waste produced in sawing and manufacturing timber and wooden products, and old wood from torn-down buildings and worn-out furniture and other products is eventually used for fuel. The total annual consumption of wood for fuel is estimated at 38.2 million cubic m., or 0.63 per capita. Not including the wood-waste and fruit trees, this is equivalent to the growth on 6,800,000 hectares, or 14.4 per cent of the land surface of Germany. Economically, it is most unwise to use wood for fuel which is suitable for other purposes. Iron and cement cannot replace timber for construction; on the contrary, the tendency is to use even more wood. Wood is indispensable for paper pulp; in 1913, 3.8 million cubic m. of domestic wood, $\frac{9}{10}$ of it spruce and fir, was used for pulp. Mine timbers required 6,896,571 cubic m. in 1913, mostly pine. One cubic m. is required to mine 30 tons of Ruhr coal, or 100 tons of brown coal, which have 50–200 times the heating value. The entire annual cut of German forests would supply 4 weeks fuel requirements if coal could be entirely dispensed with. This is impossible, however, especially for railroads and large industrial plants.—*W. N. Sparhawk.*

127. Foxworthy, F. W. **Commercial woods of the Malay Peninsula.** Malayan Forest Rec. 1. *1–150.* 1921.—This is an account of timber in the Malay Peninsula. The consumption and supplies of wood are discussed, and exhaustion in 99 years is predicted unless adequate steps are taken to prevent it. In the first place current wasteful methods must be changed. A technical description of Malayan woods is given, their uses are described, and their Malay names, scientific identifications and descriptions are given.—*I. H. Burkill.*

128. Foxworthy, F. W. **Minor forest products of the Malay Peninsula.** Malayan Forest Rec. 2. *151–217.* 1922.—Present knowledge of forest products other than timber is summarized. Rattans, gutta percha, and damar (resins) are the most important commercially. Successive chapters deal with palms and palm products; gums, oils, and resins; incense woods;

tanning materials; dye plants; fiber plants; poisonous plants; medicinal plants; food plants from the forest.—*R. E. Holttum.*

129. Gardner, C. A. **The forest formations of Western Australia: 2. The jarrah forest.** Australian Forest. Jour. 6: 104–108. 1923.

130. H., von. **Die Nonnekatastrophe in den Zittauer Wäldern. [The nun-moth catastrophe in Zittau forests.]** Deutsch. Forstzeitg. 38: 490–491. 1923.—In 1922 the moths defoliated 1,034 hectares, or $\frac{1}{6}$ of the total forest area, and killed an amount of timber equal to 8 times the annual cut. In many Bohemian forests the proportion of destruction was even greater. There appears to be a connection between moth infestations and weather conditions, this outbreak having been preceded by the dry summer of 1921, and having been practically stopped by the cool, wet spring of 1923.—*W. N. Sparhawk.*

131. Hall, William L. **The forests of the Hawaiian Islands.** Australian Forest. Jour. 6: 118–122. 1923.—The forest conditions and the characteristics of the important species are described.—*C. F. Korstian.*

132. Hawley, L. F. **Effect of adding various chemicals to wood previous to distillation.** Jour. Indust. and Eng. Chem. 14: 43–44. 1922.—Data are presented indicating that yields of wood alcohol from destructive distillation of certain woods can be materially increased by the addition of sodium carbonate.—*Henry Schmitz.*

133. Hawley, L. F., and S. S. Aiyar. **Distribution of methoxyl in the products of wood distillation.** Jour. Indust. and Eng. Chem. 14: 1055–1057. 1922.—Methoxyl groups in wood are the source of the menthanol obtained by destructive distillation, but only 16–30 per cent of the methoxyl goes to form menthanol. This paper describes the search for the other 70–84 per cent in the crude products of distillation of maple, oak, and incense cedar. The changes in distribution of methoxyl when wood is treated with sodium carbonate and phosphoric acid before distillation are also described.—*Henry Schmitz.*

134. Herrmann. **Balsa-holz (Ochroma lagopus Sw.). [Balsa wood.]** Deutsch. Forstzeitg. 38: 483–485. 1923.—The writer describes the physical properties and uses of balsa wood, first introduced into Germany in 1920.—*W. N. Sparhawk.*

135. Hohenadl, W. **Neue Grundlagen der Holzmessung. [New fundamentals of timber measurement.]** Forstwiss. Centralbl. 45: 131–141. 1923.—Formulae are developed which are said to describe the growth in volume of trees and stands at any period in their development.—*W. N. Sparhawk.*

136. Hohenadl, W. **Ziele und Methoden der forstlichen Forschung oder "Praktischer Beweis dass die Mathesis bei dem Forstwesen unentbehrliche Dienste tue." [Aims and methods of forest research; mathematics indispensable.]** Forstwiss. Centralbl. 45: 186–194, 226–232, 261–272. 1923.—The close relation between science and practical work is discussed, and it is argued that theories founded upon purely qualitative concepts do not afford satisfactory bases for practice. Only quantitative, mathematically formulated theories can at all times be tested for accuracy. In the past, forestry has depended too much upon qualitative methods and empirical results. Real progress requires quantitative research, for which an intensive training in higher mathematics is indispensable.—Several formulae are given applicable to the development of form of trees, with tables comparing empirical and computed form factors.—*W. N. Sparhawk.*

137. Holmes, J. S. **A minimum forest policy for the Southern Appalachians.** North Carolina Geol. and Economic Surv. Press Bull. 173. *6 p.* 1920.—The forestry situation in the Southern Appalachians is discussed and essential fire protection measures advocated.—*C. F. Korstian.*

138. Krauss, G. **Beitrag zur Klärung der Vegetationsbedingungen der Heide im allgemeinen und der Rohhumusneigung, besonders der Buche in Neubruchhausen. [Conditions giving rise to the heath type in general and the formation of raw humus, especially in the beech forests in Neubruchhausen.]** Forstwiss. Centralbl. 45: 173–185. 1923.—The close correlation of climate, soils, and vegetation is pointed out. In Europe there is a connected series, beginning with the cool, damp, cloudy climate of the extreme northwest (Faroe and Orkney Islands), which results in bleached-out acid soils, bearing only stunted heather. Then comes the warmer, drier, central European climate, with more rapid disintegration of humus, and soils

gradually becoming browner and richer in plant food, to about the line between Hungary and Ukraine. In this region first come conifers and then, as fertility increases and acidity diminishes, deciduous broad-leaved trees. Farther to the southeast, excessive evaporation and meager precipitation tend to bring the alkaline salts upward, until desert conditions are reached in the Caspian region.—The excessive moisture and low evaporation in the northwest result in leaching out of potassium, sodium, and carbonates of calcium and magnesium, and by means of the humic acids the less soluble aluminum and iron compounds are carried off. The soil moisture available to the plant roots during the growing season is limited in amount and deficient in plant foods, hence large trees cannot develop, but give way to the shallow-rooted heather. Neither total precipitation nor that during the growing season is the critical factor, but the amount of salts, particularly lime, furnished by the water which penetrates to the subsoil and absorbed by the roots. The author holds that Erdmann's method of increasing available lime by introducing deep-rooted species is better than Süchting's artificial liming. —*W. N. Sparhawk.*

139. Lakari, Oiva. **The Finnish state forests.** Bank of Finland Monthly Bull. 9. *17–22. 4 fig., map.* 1922.—The state forest area of Finland is 12,516,398 hectares, of which 5,695,850 are in productive forest, 2,122,958 in poor forest, and the rest in waste except for a small area devoted to buildings and gardens. Estimates of the amount of standing timber and of the annual cut are given, the State forest administration is described, and statistics of revenues and expenditures are given. Cutting is regulated according to periodically revised working plans, with due regard to the rate of growth and the condition of the forest. While some sowing and planting are done, natural seeding is generally relied upon to reproduce the stands. Systematic draining of boggy lands is steadily adding to the area of productive forest, and means of both water and land transportation are being improved and extended.—*W. N. Sparhawk.*

140. Lamb, George N. **Timber resources of Moore County.** North Carolina Geol. and Economic Surv. Press Bull. 169. *4 p.* 1919.

141. Lamb, George N. **Timber resources of Union County.** North Carolina Geol. and Economic Surv. Press Bull. 168. *4 p.* 1919.

142. Lawrence, A. O. **Susceptibility of eucalypts to drought.** Australian Forest. Jour. **6:** 133–134. 1923.—The death of several species of eucalypts in the forests of the Kiewa River Valley near Dederang is noted.—*C. F. Korstian.*

143. Legat, C. E. **Annual report of the Forest Department for the year ending March 31, 1922.** *34 p.* Union of South Africa: Pretoria, 1923.—General features of the year's work are described. About 7,081 acres were planted, making the total planted area to date 86,343, and 542 acres of sand dunes were reclaimed. Studies were made of the physical properties, seasoning, preservation, and utilization of several woods.—*E. N. Munns.*

144. Merriam, H. C. **Hardwood distillation.** Jour. Indust. and Eng. Chem. **14:** 860–862. 1922.—The progress made in the methods of wood distillation is briefly summarized.—*Henry Schmitz.*

145. Munns, E. N. **Erosion and flood problems in California.** Rept. to Legislature on Senate Concurrent Resolution No. 27, (1921) Sacramento, California. *9–166. 44 fig., 3 maps.* 1923.—Approximately 2,201,700 acres in various parts of California have been devastated of the vegetative cover to a greater or less extent. Smelter fumes, over-grazing, fires, and lumbering have been the chief agencies responsible. The area is constantly increasing as a result of lumbering. A serious economic loss is involved in the reduced productivity of the lands, the deposition of eroded material in streams and harbors, and the waste of water. After fire and erosion, the water holding capacity of the soil is less, the humus is destroyed, and there is decided change in the nitrogen content of the soil. On over-grazed ranges, erosion has been responsible for a lowered water table which in turn reduces the carrying capacity through the invasion of species of inferior forage value.—Erosion is caused primarily by the disturbance of plant cover and may be corrected, after many years, through the reestablishment of cover. Reforestation and revegetation are necessary on thousands of acres. As a temporary expedient check, dams in the smaller tributaries are advocated. Legislation is recommended to secure better fire protection, to prevent the liberation of poisonous fumes, and

to insure some measure of forestry practice on private lands. In the pine region, high speed engines and high lead logging should be abolished. To secure adequate new growth all trees under 20 inches should be left for seed and additional growth. All slashings should be protected from fire. In the redwood forests, cutting should not precede logging by more than one year and slashings should not be burned a second time. Where possible Douglas fir trees should be left for seed. To secure a full stocking, planting is necessary.—A policy of reforestation for the 1,300,000 acres in need of planting should be adopted by the state and national governments in cooperation with private owners. Other recommendations include a revision of the tax laws to permit private forestry through exemption of growing stock and substitution of a yield tax for the annual tax; the acquisition of lands by the state and by municipalities for forestry purposes and to insure protection of the water supply; and a program of forest investigations.—*W. H. Meyer.*

146. O., F. C. **The forests of Hesse-Darmstadt.** Indian Forest. **49:** 368–375. 1923.—The conditions and silvicultural management of the state forests are described.—*E. N. Munns.*

147. Parr, S. W., and C. N. Davidson. **The calorific value of American woods.** Jour. Indust. and Eng. Chem. **14:** 935–936. 1922.—The calorific values of pine, oak, hickory, cherry, birch, and poplar (species not given) were determined. The results agree fairly closely with those obtained by Gottlieb.—*Henry Schmitz.*

148. Pratt, Joseph Hyde. **Forestry problem of the Southern Appalachian and Southeastern States.** North Carolina Geol. and Economic Surv. Circ. 3. *14 p.* 1922.—The general forestry conditions in these states and their relation to the forestry problems confronting the whole country are discussed.—*C. F. Korstian.*

149. Ritchie, E. G. **Forests in relation to water conservation.** Australian Forest. Jour. **6:** 89–95. 1923.—Forests in conserving and protecting the water supply are essential to the survival of population on areas devoted to settlement.—*C. F. Korstian.*

150. Ritter, G. J., and L. C. Fleck. **Chemistry of wood. V. Results of analysis of some American woods.** Jour. Indust. and Eng. Chem. **14:** 1050–1054. 1922.—Complete analyses of a considerable number of American woods were made. The results show that: (1) hardwoods yield more acetic acid than soft woods by the acid hydrolysis process; (2) hardwoods average about 100 per cent higher in pentosan than softwoods; (3) softwoods contain more methyl pentosan than hardwoods; (4) the celluloses isolated from different species differ in furfural-producing substance; and (5) softwoods contain more beta-cellulose than hardwoods. Analyses of the following woods not previously analysed are given: *Pinus ponderosa, Chamaecyparis nootkatensis, Libocedrus decurrens, Quercus densiflora, Sequoia sempervirens, Prosopis juliflora, Ochroma lagopus* and *Hicoria ovata.*—*Henry Schmitz.*

151. Rubner. [Rev. of: Aaltonen, T. **Über die natürliche Verjüngung der Heidewälder im Finnischen Lappland. (Natural reproduction in the heath forests of Finnish Lapland.)** Metsätieteelisen Koelaitoksen Julkaisuja. *319 p., 84 fig., 13 maps, with 47 p. German summary.* Helsingfors, 1919.] Forstwiss. Centralbl. **44:** 277–283. 1922.—The author believes lack of available moisture, resulting from root competition, to be chiefly responsible for failure of pine and other species to reproduce on certain sites in Lapland. Hesselmann, on the other hand, considered water a relatively unimportant factor in similar forests of Swedish Norrland, and ascribed the lack of young growth to lack of nitrogenous plant food, a result of the failure of the humus to decompose. Both may be right. Even more important for central European foresters is the discussion of the relation between type-indicator plants and ability of stands to reproduce themselves.—*W. N. Sparhawk.*

152. Sava, S. **Gli olii commestibili ed il Corylus avellana Lin. [Edible oils from Corylus avellana.]** Staz. Sper. Agrar. Ital. **55:** 34–50. 1922.—The methods of extracting the oil from *C. avellana,* the cost of production, and the composition of the plant are discussed.—*A. Bonazzi.*

153. Sava, S. **Sul nocciuolo nella silvicoltura, e i sottoprodotti del bosco. [Corylus avellana in the forest, its importance, and the value of the by-products of silviculture.]** Staz. Sper. Agrar. Ital. **55:** 278–291. 1922.

154. S[chaeffer], A. **Analyse d'une coupe de taillis sous futaie. (Analysis of a cutting of coppice under standards.)** Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de

l'Est **15:** 12–13. 1923.—An interesting analysis is made of the data in a marking notebook. For the communal forest of Citers the numbers and sizes of different species cut and reserved at different periods are shown.—*J. Kittredge, Jr.*

155. Schaeffer, A. **Cépées d'anciens.** [**Groups of veterans.**] Bull. Trimest. Soc. Forest. Franche-Comté et Provinces de l'Est **15:** 7–12. 1923.—A table enumerates the species, sizes, condition and values of a considerable number of groups of large trees of over $1\frac{1}{3}$ m. in circumference. The wood of these trees is of the highest quality and markedly increases the value of the forest. Such groups of valuable species should more often be reserved.—*J. Kittredge, Jr.*

156. Schmitz, H. **Studies in wood decay. III. The toxicity of western yellow pine crude oil to Lenzites saepiaria Fries.** Jour. Indust. and Eng. Chem. **14:** 617–618. 1922.—Because of its low toxicity and high rate of evaporation, the crude oil from the distillation of western yellow pine is of little value as a general wood preservative. The methods of determining the toxicity of wood preservaties are discussed.—*Henry Schmitz.*

157. Schorger, A. W. **The gelatinization of lignocellulose. I.** Indust. and Eng. Chem. **15:** 811–814. 1923.

158. Sherrard, E. C., and G. W. Blanco. **Some of the products obtained in the hydrolysis of white spruce wood with dilute sulphuric acid under steam pressure.** Indust. and Eng. Chem. **15:** 611–616. 1923.

159. Sherrard, E. C., and W. H. Gauger. **Effect of salts upon the acid hydrolysis of wood.** Indust. and Eng. Chem. **15:** 63–64. 1923.—The purpose of this investigation was to find salts that could be used as catalysts to increase the yield of alcohol from the acid hydrolysis of wood. Experiments with the hydroxysulfonic acids indicate excellent possibilities.—*Henry Schmitz.*

160. Simonsen, John Lionel. **Constituents of some Indian essential oils. The essential oil from the gum-oleo-resin of Boswellia serrata Roxb.** Indian Forest Rec. **9**[6]: 289–306. 1922.

161. Singh, Sher. **Oecology of Indian savannah plants.** Indian Forest. **49:** 356–368. *Pl. 15.* 1923.—The savannah plants have acquired several characteristic adaptations which fit them for competition with light seeded, light-loving, gregarious grasses. These plants are essentially xerophytic like the ordinary desert plants, but they differ from the latter in that they have large leaf laminae. Greatest success in afforesting savannahs will be obtained with species possessing very large leaves, especially those which can produce anthocyan coloring and are more or less evergreen. They should also be fairly fire-resistant and hardy to severe frost and drouth. The selection of species depends on local soil and climatic conditions, rates of growth, and economic value.—*E. N. Munns.*

162. Vanselow. **Volkswirtschaft und Wirtschaftsverfahren.** [**Relation between economic conditions and methods of forestry.**] Forstwiss. Centralbl. **45:** 170–173. 1923.—The prevailing economic needs have influenced the object of forest management and, consequently, the silvicultural methods employed in the Spessart forest of Bavaria, during several hundred years. At first the need was for game cover and mast, with limited local requirements for wood; then gradually a demand for larger quantities of firewood developed; and finally the present need for maximum yields of industrial timber and firewood with the desire to obtain the greatest possible net income.—*W. N. Sparhawk.*

163. Volger, K. **Studienreise nach Neubruchhausen.** [**Studies at Neubruchhausen.**] Forstwiss. Centralbl. **45:** 121–131. 1923.—The ideas of Erdmann and of Süchting on the causes of and remedies for "sick" soil and formation of dry turf are discussed. Erdmann holds that the low yields of northwestern German forests are attributable to the formation of dry turf, rather than to poverty of soil, and that the kind of timber rather than soil conditions, is responsible for the turf. To prevent its formation, one should grow a mixture of species, thin frequently, and secure reproduction early. Larch is best for breaking down humus, and fir and Douglas fir are also good. Next in order come birch, red oak, black cherry, white pine, alder, and last of all, beech, pine, and spruce. To cure "sick" soil, the turf may be treated by harrowing and applying lime, by mixing with sand, by harrowing without lime, or by removing it entirely or raking into windrows. His system of management involves early and frequent thinnings, natural reproduction together with sowing of desirable species, and a 2-

storied stand.—Süchting holds that the nature of the soil and climate, not the tree species, is responsible for dry turf, lack of lime and of moisture being the principal factors. Spruce forms turf because the forester does not thin early enough and let light and moisture reach the soil. Not the turf, but the lack of plant food in the soil causes loss of increment. He advocates the application of lime as a remedy.—Volger considers both views partly right. Some species are more likely to form dry turf than others, though the chemical composition of the soil is important. Pine forms turf on some soils, on others it does not. To obtain maximum yield and satisfactory natural reproduction, the maintenance of proper soil conditions is more essential than the condition of the stand itself.—*W. N. Sparhawk.*

164. Weber, Heinrich Wilhelm. **Möllers Dauerwaldgedanke. Eine Kritik.** [A criticism of Möller's "continuous-forest" concept.] Forstwiss. Centralbl. **45**: 255–260. 1923.—The idea that the "needs of the forest" should be the governing factor in its management is untenable. The real factor is the utilization of the forest to supply human needs.—*W. N. Sparhawk.*

165. Wise, L. E. **Contributions to chemistry of wood cellulose. II. Nature of wood cellulose.** Indust. and Eng. Chem. **15**: 711-713. 1923.

166. Wise, L. E., and W. C. Russell. **Contributions to chemistry of wood cellulose. I. Acetolysis of spruce pulp.** Jour. Indust. and Eng. Chem. **14**: 285–287. 1922.

167. Wise, L. E., and W. C. Russell. **Contributions to chemistry of wood cellulose. III. Acetolysis reaction applied to cellulose isolated from commercial species of wood.** Indust. and Eng. Chem. **15**: 815. 1923.

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 15, 23, 34, 52, 75, 216, 232, 242, 250, 257, 317, 369, 374, 417, 435, 443, 490, 543, 544)

168. Biffen, R. H. **Wheat breeding experiments.** Jour. Roy. Agric. Soc. England **83**: 35–44. 1922.—Elements of Mendelism are illustrated by inheritance in wheat. English wheats produce well but are deficient in technical value. Field trials showed that not all imported wheats of good "strength" retain this character when grown under English conditions. The variety, Red Fife, has maintained its excellent technical value after 20 years cultivation in England. New hybrid varieties have been produced, but not distributed, which combine the baking quality of Red Fife with the good straw and large heads and grain of the English varieties. The new varieties are superior to Yeoman, a hybrid distributed some years ago.—Hybrid wheats resistant to attacks of yellow rust (*Puccinia glumarum*) have been produced which are also desirable in other respects for the English farmer. Resistance to rust was secured from the variety American Club.—In breeding for resistance to mildew black Persian was the only variety found showing resistance. Fertile crosses were secured between Black Persian and Rivett [*Triticum turgidum*] and resistant hybrids were secured. It is hoped, also, to secure a resistant hybrid bread-wheat variety.—Spring sown wheats in England do not yield well, evidently due in part to the few fertilized florets per spikelet. Two varieties from Szechuan, China, were found to set 4–5 grains per spikelet. These crossed with Rivett showed that the character "early ripening" was inherited, as hybrids were secured which ripened as early as the Chinese varieties. Crossing the Chinese wheats with bread wheats produced hybrids with 5–8 grains per spikelet. These hybrids were spring-sown and during the very dry season of 1921 seemed to possess marked properties of drouth resistance.—*L. R. Waldron.*

169. Boshnakian, S. **The genetics of squareheadedness and of density in wheat, and the relation of these to other characters.** New York [Cornell] Agric. Exp. Sta. Mem. **53**: 801–882. *2 pl., 8 fig.* 1922.—The material studied resulted from crosses, many of them interspecific. Over 60 F_2 progenies were used and of these 14 were carried through the F_3. The terms "density" and "squareheadedness" are used to designate 2 phenomena of internode length. Squareheadedness is a combination of a number of characters which are produced by the shortening

of the terminal rachis internodes due to pressure developed by differential growth of culm and sheath. It is expressed by the coefficient found by dividing the number of internodes in the terminal $\frac{1}{3}$ of the rachis by the number of internodes in the central $\frac{1}{3}$. Rapid growth of culm, failure of the sheath to unfold, and spikes with soft spreading glumes tend to increase squareheadedness. Factors either genetic or environmental which affect the development of the above-named characters affect the degree of square-headedness. Density is the shortening of all the rachis internodes. It is determined by dividing the length of the rachis in mm. by the number of internodes. Density is purely an inherited character.—The author's results may be summarized as follows: Squareheadedness, being the result of a combination of growth factors, shows a complex mode of inheritance. The spelt character appears to inhibit the expression of squareheadedness. Plants that are heterozygous spelts or that carry modifiers which dilute the spelt character are much more likely to be squareheaded than intensely spelted plants.—Density, studied primarily on the progeny of a number of crosses between various lax varieties and Dale Gloria (*Triticum compactum*), proved dominant over laxness with a single main factor concerned, although in some crosses multiple factors were shown to exist. The heterozygous forms were somewhat laxer than the homozygous dense forms, but by no means intermediate between the dense and lax parents. The F_2 curves were bi-modal and discontinuous. Evidence is given for the presence of modifiers or additional density factors capable of modifying density only within narrow limits. Density, like squareheadedness, is affected to a large extent by the presence of the spelt factor. High degrees of correlation were found between various size characters and average rachis internode length. A single dwarfing factor is considered responsible for density and the shortening of the other length characters. Hybrid progenies showed all types and grades of combinations of squareheadedess and density, these characters being inherited independently.—*J. B. Harrington.*

170. Carril, Luis Maria del. **Aplicaciones de la genetica a los problemas agricolas Argentinos.** [**Application of genetics to the agricultural problems of Argentina.**] Rev. Facultad Agron. y Vet. Univ. Nacion Buenos Aires 4: 127–152. *10 fig.* 1922.

171. Correns, Carl. **Vererbungs Versuche mit buntblättrigen Sippen. VI. Einige neue Fälle von Albomaculatio. VII. Über die Peraurea-sippo der Urtica urens.** [**Genetic investigations on variegated leaved plants. VI. A new case of albomaculata. VII. On the "Peraurea" types of Urtica urens.**] Sitzungsber. Preussisch. Akad. Wiss. Berlin 1922: 460–486. *Illus.* 1922.—A study was made of variegated plants of *Stellaria media, Senecio vulgaris, Taraxacum officinalis,* and *Hieracium auricula.* The mode of inheritance was very nearly identical in each form, resembling former work on albomaculatus type of variegation in *Mirabilis.* (1) The seed from pure yellowish white plants gave only pale progeny, not capable of living (expallescens). This was true, with very few exceptions, regardless of how the pollination was made. (2) Seed from pure green plants produced only their kind. (3) The distinctly variegated flowers produced progeny of 3 kinds: yellowish white, variegated, and entirely green, regardless of the kind of pollen used. The degree of variegation of the mother plant was reflected in that of the progeny. (4) Green progeny from variegated plants produced only pure green plants.—Evidence is given to show that the albomaculatus type of variegation is due to a disease of the egg cytoplasm, from which there is an equal possibility of sound (green) and diseased (yellow or white) tissue arising, because of the uneven distribution of sound and diseased cytoplasm at the time of embryonic cell division. There is a differential cell division among the sound and diseased cells, the sound cells dividing more often. In case of the true albomaculatus type the pollen tube does not carry over with the generative nucleus any, or at least no active amount of cytoplasm to the egg.—Another type of variegation, albomarginata, found in *Lunaria annua* is different from albomaculata in that it is determined by a genetic factor. The golden character (peraurea) in *Urtica urens* is a dominant condition of which the homozygous dominants die in the embryonic stage, or even before the ovule is fertilized. All golden plants were found to be heterozygous and produced 2 golden to 1 pure white.—*W. A. Carver.*

172. Dahlgren, K. V. O. **Geranium bohemicum L. × G. Bohemicum deprehensum Erik Almq., ein grün-weiss-marmorierter Bastard.** [**Geranium bohemicum × G. bohemicum deprehensum, a green-white-marbled hybrid.**] Hereditas 4: 239–250. *10 fig.* 1923.—In this

cross the F_1 seedlings were found to be variegated (green and white), although both parents were full green. Most of the hybrids died in the seedling stage; but 2 flowered, showing a characteristic vegetative "segregation" of green and white tissue, probably being sectorial chimaeras. They did not set seed, even when back-crossed to the parental types. No explanation is given for this situation, although several hypotheses are suggested.—*E. W. Lindstrom.*

173. Dendy, Arthur (Editor). **Problems of modern science. V. Biology,** by Arthur Dendy. VI. **Botany (and genetics),** by R. Ruggles Gates. *p. 111–176.* Henry Holt & Co.: New York, 1922.—V. The various divisions of biological science are disussed in their relation to one another and to a system of classification. The fields of each are defined. Genetics is "the experimental study of heredity" and "dominated almost exclusively by the Mendelian school." "Arresting and important as these results undoubtedly are" (the work of the American school under the leadership of Thomas Hunt Morgan), "however, we must be on our guard against supposing that the factorial hypothesis can ever provide a complete solution of the problem of heredity. A great deal of nonsense has been talked about organisms being built up entirely of separately heritable unit characters, and about all species having arisen through the crossing of pre-existing forms. The truth appears to be that the Mendelian factors, after all, are only modifying agents." The nature of Mendelian factors, the inheritance of acquired characters, biometry, and the work of Guyer and Smith with sensitised serums are discussed. —VI. The author presents a discussion and brief historical survey of the work of Mendel and de Vries and its effect.—*Orland E. White.*

174. Funkquist, H. und Nils Boman. **Vererbung "Weisser Abzeichem" bei Rindern. [Inheritance of "white markings" in cattle.]** Hereditas **4:** 65–80. *10 fig.* 1923.—The writers have studied the inheritance of white head markings of cattle at 2 stations in Sweden. They find it impossible to apply any simple Mendelian scheme as white marked calves may come from parents both unmarked, and unmarked calves may come from parents both marked. They advance a 3-factor explanation which they show can explain the results of their crosses qualitatively and quantitatively if they assign a suitable genetic formula to the parents in each case.—*Sewall Wright.*

175. Goldsmith, William M. **The laws of life, principles of evolution, heredity and eugenics.** *441 p., 137 illus.* Richard G. Badger: Boston, 1922.—A comprehensive text on evolution, genetics and eugenics written primarily for the lay public, high school students and students of colleges and universities where the biology section does not have a specialist in charge of the genetic phase of biology. The ground covered includes the history of the evolution theory from ancient times, the evidences of evolution, animal relationships from a phylogenetic standpoint, environmental factors and effects. variation, mutations, the cells as a carrier of heritage, hybridization, sterility, Mendel's laws, the factor hypothesis, apparent exceptions to the laws of inheritance, linkage, crossing-over, non-disjunction, and human inheritance. Under human inheritance are chapters on negro-white crosses, sex inheritance, inheritance of feeble-mindedness, and various mental and moral traits, "criss-cross" inheritance, pre-natal influences, supposed inheritance of disease, and moulding the super-man.—*Orland E. White.*

176. Hagiwara, Tokio. **Genetic studies of corolla-design in the morning glory.** [In Japanese; English résumé.] Bot. Mag. Tokyo **36:** 157–158, (205)–(225). 1922.—The author reports on the genetic relationship of 3 flower types: totally colored, Hukurin type with white peripheral ring of uniform width, and star type with white edging of varying widths corresponding to a star-shaped mass of color at the center. In the author's experiment Hukurin is a simple dominant to totally-colored (Takezaki had reported some Hukurin strains as recessive). He attributes the star patterning to a single factor which expresses itself if factors making for Hukurin be present. Hybrids between Hukurin and star are intermediate and give in the following generation a 1:2:1 ratio.—*J. P. Kelly.*

177. Hallquist, Carl. **Gametenelimination bei der Spaltung einer Zwerghaften und Klorophylldefekten Gerstensippe. [Gamete elimination in the segregation of half-dwarf and chlorophyll-defective barleys.]** Hereditas **4:** 191–205. *4 fig.* 1923.—A mutant type of barley, showing defective chlorophyll and dwarfing was proved to be dependent upon a simple, recessive gene. The percentage of defectives, however, was statistically less than expected, and

could not be accounted for by differential germination between seed producing normal plants and those producing the mutant type. Progeny tests, using the proportion of homozygous normal to heterozygous genotypes in a cross of such types, showed that normal segregation occurred in megasporogenesis. But in microsporogenesis evidence pointed to the fact that there was an elimination of some of the gametes bearing the defective gene.—*E. W. Lindstrom.*

178. Hammarlund, C. **Über einen Fall von Koppelung und freie Kombination bei Erbsen. [A case of linkage and independent assortment in peas.]** Hereditas 4: 235–238. 1923.—Crosses were made between a yellow podded variety of the sugar pea (peas with edible pods or *Pisum sativum saccharatum*) with white flowers, and 2 forms of the same subspecies having violet flowers and green pods. These 2 forms were morphologically alike and had the same mother parent, but their genetic behavior was very different. When the yellow pod, white flowered type was crossed with violet flowered, green pod type A, the F_1 was violet flowered, green pod, the F_2 very closely approximating the usual 9:3:3:1 di-hybrid ratio. The numbers obtained were 194:60:58:20, while the theoretically expected ratio was 186:62:62:20. The same plant of the yellow pod, white flowered variety was crossed reciprocally with green-pod, violet flower type B, the F_1 giving the same results as the preceeding cross, but the F_2, instead of giving the expected 9:3:3:1 ratio, gave results showing a high coupling or linkage between violet flower and green pods and white flowers and yellow pods. The actual results obtained in both crosses (made reciprocally) were 427 green pod, violet flower: 5 yellow pod, violet flower: 8 green pod, white flower: 153 yellow pod, white flower. Exact degree of linkage through back crosses has not been determined.—*Orland E. White.*

179. Harris, J. A. **Galton and Mendel: their contribution to genetics and their influence on biology.** Sci. Monthly 16: 247–268. 1923.—Gregor Mendel and Francis Galton, born the same year, have much in common, yet have many points of contrast. Galton's inheritance and early environment were of the best whereas Mendel came of an obscure family and had limited educational advantages. Mendel deserves greater credit for achievement. Galton worked in diverse fields. He contributed the foundation of finger print identification, the idea of anthropometric laboratories, the model of researches in eugenics, and founded the science of biometry. Galton's influence was more varied than Mendel's; even in genetics Galton's influence has been greater. Mendel had only ephemeral influence on contemporaries; while Mendel's paper lay unheeded 3 decades, Galton's published work influenced scientific thought, "Hereditary Genius" passing through 4 editions. Galton's influence stimulated in part even the studies that led to the "rediscovery" of Mendel's laws. Galton's chief contribution was in method. Galton and Mendel both recognized the value of experimental or observational data and of mathematical formulae. It was not the ecclesiatic Mendel, but the biologist Galton who foresaw the possibilities of the application of the laws of biological science to the improvement of the human race. Galton not only contributed to the researches in eugenics but endowed a laboratory. "Both men worked in advance of the science of their own generation. Both influenced * * * the science of subsequent generations."—*J. Ben Hill.*

180. Hastings, G. T. [Rev. of: Abbott, Charles L. **What comes from what or the relationships of animals and plants.** 48 p., 41 diagr. Published by the author: St Paul, Minnesota, 1922.] Torreya 23: 72. 1923.

181. Hayes, H. K. **Inheritance of kernel and spike characters in crosses between varieties of Triticum vulgare.** Minnesota Univ. Res. Publ. Studies Biol. Sci. 4. *163–183.* 1923.—Length of seed in F_2 to F_5 families of crosses between the short-kerneled awnless Marquis variety and the long-kerneled awned Preston variety was secured in awnless, bearded, and heterozygous families. Length of kernel was evidently influenced nearly or quite entirely by genetic factors. Ranges of kernel length in the hybrid families were coterminous with parental kernel length but not evidently transgressive. Kernal length means were slightly higher for the bearded than for the awnless families. In a comparison of kernel length in awnless, tip-awned (heterozygous), and bearded spikes in heterozygous families, an increase of seed length occurred from awnless through tip-awned to bearded spikes. Presence of beards influenced the kernel to increase its length. In the foregoing hybrid families and in hybrid families secured by crossing Marquis with long-kerneled Bluestem, nearly or quite homozygous conditions were secured relative to seed length in the F_5 generation.—Correlations between paren-

tal and progeny seed length were high in all cases. Correlations obtained between percentage of seed plumpness and length of seed were either not significant or not consistent. No apparent relation exists between character of chaff (smooth or hairy) and yield per plant. In Marquis-Preston hybrids slight or moderate increase of seed plumpness was found in bearded families compared with awnless. Correlation coefficients between plumpness of seed and yield per plant in Marquis-Preston crosses were all positive but not significant in all cases. A positive correlation of this kind is not necessarily genetical in character. Positive correlations were found to exist, in a measure, between seed plumpness in successive generations.—Texture of endosperm (whether starchy or corneous) seemed to be inherited in the awnless families of the Marquis-Preston hybrids, judging by correlation coefficients, but not in bearded families.—In the F_3 generation, increased yield of grain of bearded over awnless plants was $0.4 \pm .095$ gm. per plant; in the F_4 and the F_5, increases were $0.3 \pm .04$ and $0.3 \pm .07$ gm. per plant, respectively. Yields per plant of parental varieties are given for comparison.—No correlation was found between high yielding plants of one generation and offspring of the higher yielding plants of the following generation.—*L. R. Waldron.*

182. Honing, J. A. **Canna crosses I.** Mededeel. Landbouwhoogeschool Wageningen 26^2: 1–55. *8 pl. (partly col.)* 1923.—The number of chromosomes in these cannas was found, in agreement with recent observers, to be 9 pairs. The 2 species crossed differed probably in more than 20 points. Only 1 F_1 plant could be obtained. Over 1,000 F_2 seedlings were raised by selfing. With regard to length of leaf, the standard deviations for the 2 parents were approximately 9 and 11; for F_1 clones, 13; and for F_2 plants, 12. For leaf breadth, the standard deviations were: parents, 3.4 and 2.6; F_1, 3.2; and F_2, 3.6. The ratio of plants with red-margined leaves to those without red on the leaves, in F_2, was 625:543; which fits a 9 to 7 ratio badly. However, out of the 5 F_3 sibships with more than 20 plants each, 3 gave a 3:1 ratio; and 2, a 9:7 ratio. Two F_3 sibships, from parents with green leaves, were constant green. In the back-cross of F_1 with the green-leaved parent, the totals were 136 red-margined to 388 green-leaved. F_1 crossed by the red-margined parent gave 79 plants, all red-margined. With regard to red stripes, wax on the leaves, number of staminodes, and length and breadth of staminodes, no clean-cut Mendelian results were obtained. The segregation in F_2 with regard to flower color was 500 red to 172 yellow. The back-cross gave 212 red to 220 yellow. Plants with red-margined leaves always had red flowers; but plants with green leaves had either red or yellow flowers; there being a 9:3:4 proportion, which was confirmed by the back cross. The red flowers, however, were classified into 8 grades, and the yellows into 3. Attempts were also made to trace the Mendelian inheritance of deep vein coloring of staminodes, yellow border of red flowers, and red spotting of yellow flowers.—*John Belling.*

183. Ikeno, Seiitaro. **Studies on the genetics of flower-colours in Portulaca grandiflora.** Jour. Coll. Agric. Imp. Univ. Tokyo **8**: 93–133. *1 pl.* 1921.—The author reports on genetical relations of orange, yellow, red, magenta, and 2 white varieties of *Portulaca*. He postulates factors *C, G, R,* and *B* with their absences (allelomorphs) to express genotypes of these varieties. *CC* or *Cc* conditions the orange flower if present without *G*, *R* [or *B*?]. The factor designated *G* lightens color produced by *C* and makes the yellow type. Factor *R* causes *C*-coloration to become red, and *B*, a blueing gene, makes for magenta if *C* and *R* be present. White I is formulated as *cc gg rr bb* and White II as *cc gg RR BB*. The last named occasionally showed colored streaks on the otherwise clear white petals. Some unexpected colored plants among the hybrid progeny the author explains by mutation, e.g., appearance of magenta or red progeny from orange parents. *R* and *B* are said to be linked.—*J. P. Kelly.*

184. Imai, Y. **Genetic studies in morning glories VII.** Bot. Mag. Tokyo **37**: (37)–(41). 1923. [In Japanese; English résumé, p. 27.]—The author claims his data point to 2 factors responsible for the occurrence of dominant and recessive hairiness.—*J. P. Kelly.*

185. Jennings, H. S. **Crossing-over and the theory that the genes are arranged in the chromosomes in serial order.** Proc. Nation. Acad. Sci. [U. S. A.] **9**: 141–147. 1923.—Taking linkage values for 9 genes of 1st group in *Drosophila melanogaster* as an illustration, the author formulates 17 basic propositions which describe relations among genes of a linkage system. He then investigates the mathematical relations which such a system must fulfill on the hypothesis of linear order, and finds that, assuming no interference, all except 1 of the 17 propositions

are satisfied. Certain other numerical discrepancies occur between linkage values observed and calculated on the basis of linear order without interference; but these and the 17 basic propositions are fulfilled, if it is assumed that interference extending on the average to 20–25 units occurs. General formulae are presented for calculating linkage values on the assumption of no interference or any degree of interference. The author concludes that the linear theory is adequately supported by evidence.—*R. E. Clausen.*

186. Jennings, H. S. **Some consequences of different extents of interference in the crossing-over of genes.** Proc. Nation. Acad. Sci. [U. S. A.] 9: 147–149. *1 fig.* 1923.—Following the method developed in his previous paper [see preceding entry] the author investigates consequences of interference extending to various units of length. With interference extending from 20 to 30 units relations found in nature are fulfilled, and cross-over values do not rise above 50 per cent. Interference operating over distances from 35 to 90 units is shown to give maximum cross-over values exceeding 50 per cent with oscillations above and below 50 per cent as distance increases. The figure presents curves of correspondence between cross-over values and distance with interference extending over 0, 20, 25, 35, 50, 75, and 90 units.—*R. E. Clausen.*

187. Kearney, Thomas H. **Self-fertilization and cross-fertilization in Pima cotton.** U. S. Dept. Agric. Bull. 1134. *68 p., 7 pl., 4 fig.* 1923.—Experimental evidence is obtained showing that in cotton, although the flower in structure and attractiveness to insects is well adapted to cross-pollination, most of the ovules normally are self-fertilized. Locus of deposition on stigmas of self-pollen and of insect-carried pollen, and relative time of arrival of self-pollen and of foreign pollen proved not to be material factors in predominance of self-fertilization. Observations showed that, especially in Egyptian cotton (Pima variety), the majority of pollen grains reaching the stigmas originate in the same flower, this predominance of self-pollination being undoubtedly an important factor in predominance of self-fertilization. When applied separately to stigmas of different (emasculated) flowers of Pima cotton, pollen of the same variety and pollen of a specifically distinct type (Upland) proved to be about equally compatible as shown by percentages of ovules fertilized. When both Pima and Upland pollens were applied simultaneously and in approximately equal quantities to stigmas of same (emasculated) Pima flower, pronounced selective fertilization, in favor of the like pollen, resulted. Marked variations observed in degree of fertilization in different localities and seasons are probably correlated with variations in numbers and habits of the pollinating insects, chiefly Hymenoptera. Deficient pollination or fertilization is not an important factor in boll shedding at the locality where this investigation was carried on (Sacaton, Arizona.) Experimental evidence was obtained showing that strict inbreeding of Pima cotton during 7 generations caused no diminution of fertility. A bibliography of 48 titles is given.—*T. H. Kearney.*

188. Lewis, Paul A. **The relation of heredity to tuberculosis.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *178–181.* Williams & Wilkins Co.: Baltimore, 1923.—A short history of attempts to discover the relation of infection to inherited susceptibility in man is given, the results indicating a probable heritable basis which is generally discounted by physicians. A wide range of individual and racial variation in susceptibility is cited for several mammals (rat, mouse, guinea-pig, rabbit, cow). Results of inoculation of inbred lines of guinea-pigs with *B. tuberculosis* appear to indicate the presence of several resistance factors which may be inherited separately, and probably independently of age, weight, growth rate, and some other elements of vigor.—*L. C. Dunn.*

189. Lindhard, E. **Fortgesetzte Untersuchungen über Speltoidmutationen. Begranungskomplikationen bei Compactum-Heterozygoten. [Preliminary investigations on Speltoid mutations. Chromosome complications in compactum heterozygotes.]** Hereditas 4: 206–220. 1923.—In a previous paper the writer describes the appearance of speltoid mutants from the normal wheat type as well as those obtained by mutation of compactum heterozygotes from speltoid and the appearance of squarehead heterozygotes in the progeny of the compactum heterozygotes. Normal, speltoid, and compactum types form a sort of triangle, for the crossing of any 2 of these types can segregate the 3rd in heterozygous condition. Preliminary investigations (by Winge) lead to the presumption that both squarehead and compactum heterozygotes have only 41 instead of 42 chromosomes in the somatic cells. There appears to be a linkage between the factor for awns and for the compactum type.—*H. K. Hayes.*

190. Little, C. C., and E. E. Jones. **The effect of selection upon a Mendelian ratio.** Genetics 8: 1–26. *20 fig.* 1923.—This paper presents an experiment involving the question whether a simple Mendelian 1:1 ratio can be modified by selection. *Drosophila melanogaster* was used, "wild type" eye and "eyeless" being the characters employed. Attempts were made to modify the proportion of "normal"-eyed to 100 eyeless flies through both the male and female lines, and selection of high "normal"-producing lines, and low "normal"-producing lines. The various selection lines were carried from 3 to 14 generations. Contrasting the high and low lines under the circumstances most unfavorable to demonstrating an effect of selection, the ratio for all low lines combined was 122.70 ± 0.58, and for all high lines 140.65 ± 0.55. The difference is more than 20 times the probable error. The authors therefore consider that a genetic difference has been demonstrated.—*E. E. Jones.*

191. Lotsy, J. P. [Dutch rev. of: Klein, C. **Die Verbreitung des Hesperidins bei den Galieae. (Ein neuer Fall von chemischen Rassen.) (The distribution of hesperidin in the Galieae. A new case of chemical races.)** Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) I Abt. 130: 306. 1921.] Genetica 5: 81–82. 1923.

192. MacBride, E. W. **The function of Mendelian genes.** Nature 111: 394–395. 1923.—In reply to J. S. Huxley, the author states that he has never met a Mendelian mutation that was not pathological. "'Normal gene' is an imaginary section—invented to account for the damage which a 'mutant gene' introduces." Multiple allelomorphic series of mutant eye colors in *Drosophila* are plausibly explained by the gradual disappearance of red pigment of normal. Examples of "balloon wing" in *Drosophila*, "Black" in mammals, European willow grouse and red grouse of Scotland are cited. The author regards mutations as pathological disturbances of the "regulatory balance." "Regulatory balance" is the compromise of the semi-independent growths of a number of tissues and organs expressed in the normal or racial structure of the animal.—*J. Ben Hill.*

193. Martin, Ruth M. **Intermarriage of blood relatives in three old New England communities.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *278–284.* Williams & Wilkins Co.: Baltimore, 1923.—A history and recent survey are recorded of 3 towns in 2 of which inbreeding has resulted in the fixation of traits present in the original settlers,—in 1 generally high intelligence and talent coupled with a decided tendency toward insanity and suicide, in another low intelligence and moral standards. Outmarriage has been the rule in the 3rd town, the better descendants of the original good stock emigrating and being replaced by lower grade immigrants. Decadence is evident in all of the towns, although the 1st is expected to improve under the outmarriage which is now beginning.—*L. C. Dunn.*

194. Mellen, Ida M. **The effects of captivity on a sex character.** Science 56: 573. 1922.—In nature males, but not females, of many Salmonidae develop a hook on the lower jaw during the breeding season. In captivity the hook is also found "not infrequently" in females as well as in males of the brown trout.—*C. W. Metz.*

195. Morgan, T. H. **Further evidence on variation in the width of the abdomen in immature fiddler crabs.** Amer. Nat. 57: 274–283. *1 fig.* 1923.—Examinations and measurements were made of the width of abdomen and carapace in young individuals of 4 species of crab. At first the abdomen is narrow in both sexes; later, in females, it becomes much wider than that of males, but the increase in width may not keep pace with the increaee in size in some individuals, particularly during time when abdomen normally changes to female type; and in older stages a few individuals with incomplete abdomen may still be found. In fiddler crabs the abdomen is still narrow at stages corresponding to the appearance of differences in size of claws in males. In shore crabs some females with comparatively narrow abdomens were found to have reached sexual maturity.—*R. E. Clausen.*

196. Morgan, T. H. **The development of asymmetry in the fiddler crab.** Amer. Nat. 57: 269–273. *4 fig.* 1923.—In a collection of 165 young fiddler crabs measuring 1.5–4.0 mm. across the carapace, 9 had unequal claws, 100 had equal small claws, and 56 had 2 large claws. Evidence indicates that difference in size of claws may occasionally appear when individuals measure only 2–3 mm. across the carapace, and that a large proportion of males pass through a symmetrical stage with 2 large claws before attaining asymmetrical adult condition. Removal of large claw in individuals measuring 5–7 mm. across the carapace was followed by regeneration

of a large claw in place of the 1 removed, as in adults. Removal of 1 of the claws in young females resulted in regeneration of a small claw. In young crabs 1–3.5 mm. across the carapace with equal small claws, removal of the left claw resulted in development of large right claws in males whereas in females both claws remained small. Apparently removal of 1 claw influences the development of the other only in males which are operated upon before any natural difference in size has appeared.—*R. E. Clausen.*

197. Ostenfeld, C. H. **Genetic studies in Polemonium coeruleum.** Hereditas 4: 17–26. *3 fig.* 1923.—In this preliminary report the author lists the following pairs of characteristics as occurring in his cultures of *Polemonium coeruleum L.*: once-pinnate and bipinnate leaves, blue and white flowers, large and small corolla, normal and abortive stamens, presence and absence of dark eye ring toward center of corolla. His data show that bipinnate leaf and white flower are recessive to their respective allelomorphs. The crossing of females (those with abortive stamens) and hermaphrodites give mainly female plants.—*J. P. Kelly.*

198. Riddle, O. **An undescribed relation of the suprarenals to ovulation.** Proc. Soc. Exp. Biol. and Med. 19: 280–282. 1922.—Evidence is given which indicates that in normal, healthy pigeons suprarenal glands enlarge during the 4–5 days of extremely rapid growth which ova undergo immediately before their expulsion from the ovary. "The maximum size seems to be attained in the 44-hour interval between the ovulation of the 1st and 2nd ova. . . . ." Enlargement of the oviduct also occurs parallel with that of the suprarenals.—*C. W. Metz.*

199. Roach, W. A. **Studies in the varietal immunity of potatoes to wart disease (Synchytrium endobioticum Schilb., Perc.). Part I. The influence of the foliage on the tuber as shown by grafting.** Ann. Appl. Biol. 10: 142–146. 1923.—The paper takes up the question whether the immunity or susceptibility of potato tubers is affected by the foliage. The method consisted of grafting scions from immune varieties on to immune and susceptible stocks; and also scions from susceptible varieties on to both susceptible and immune stocks. In every case, if the stock belonged to a susceptible variety, the tubers were infected. If the stocks belonged to immune varieties, no infection occurred.—The conclusion is that the character of the foliage of the scion has no influence on the immunity or the susceptibility of the tubers to wart disease.—*George M. Reed.*

200. Scheidt. [German rev. of: Nägeli. **Die de Vriessche Mutationstheorie in ihrer Anwendung auf die Medizin. [The de Vriesian mutation theory in its application to medicine.]** Zeitschr. Angew. Anat. u. Konstitutionslehre 4: 33. 1919.] Arch. Rass- u. Ges. Biol. 14: 454. 1923.

201. Scheidt. [German rev. of: Pittard, E., et F. Vallet. **Note préliminaire sur la taille humaine dans le canton de Neuchâtel. [Preliminary note on human stature in the canton of Neuchâtel.]** Arch. Suisses Anthropol. Gén. 1: 223. 1914.] Arch. Rass.- u. Ges. Biol. 14: 443. 1923.

202. Shamel, A. D. **Improving cane by bud selection.** Sugar 25: 140–141, 200–202. 1923.

203. Small, J. **Evolution and geographical distribution.** Pharm. Jour. 109: 171–173. 1922.—A review of the literature and most recent conceptions on this subject are presented. Age becomes the predominant feature in demonstrating the wideness of distribution of plants and animals. The many and varied factors which slow down or accelerate the rate of spreading act on the whole, in such a regular, impartial and non-selective manner that they have practically the same effects on all related groups of plants and animals, hence may be cancelled. It is of interest to note that coming upwards from the Upper Cretaceous to the Pliocene the average area per genus decreases from 7.2 (million square miles), through 5.9, 4.6, 4.3, to 3.6; showing a continuous increase in average area with absolute age, as calculated from the previously published tables. The origin of species by mutation is interesting. It is estimated that if 1 mutation occurred once every 50 years on the average, and such a mutation might happen anywhere on the earth, that all of the Linnean species might have been produced in this manner during the estimated time of plant life on the earth. This new view, that evolution did not proceed from individual to variety, from variety to species, from species to genus, and from genus to family, but inversely, the great world-ranging families and genera appear-

ing at a very early period and subsequently breaking up into other genera and species is discussed.—*E. N. Gathercoal.*

204. Stackelberg, E. von. **Die Grundformel der regelmässigen Idiophorie. [The fundamental formula of random mating.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 130–137. 1922.—Assuming that the relative frequency of the factors of each pair of allelomorphs is known for 2 populations, the author gives the formula for the expected frequency of different classes in F_1, F_2, and all later generations. Letting m, m_1, m_2, etc., be the percentage frequences of the dominant factors A, B, C, etc., and n, n_1, n_2, those of the corresponding recessive factors in the group of males and the same symbols with primes for the females, the frequency of the classes in F_1 can be found from the expansion of the following expression: $F_1 = (mA + na)(m_1B + n_1b) * * * (m^1A + n^1a)(m^1{}_1B + n^1{}_1b) * * *$. With random mating this population reaches equilibrium in the next generation. $F_2 = (xA + ya)^2 (x_1B + y_1b)^2 * * *$ where $X = \frac{m + m^1}{2}$, etc. He thus reaches the well known result that in a random breeding population, the percentage of heterozygotes is twice the square root of the product of the homozygous classes with respect to each pair of allelomorphs. He gives a geometric construction for finding the ultimate proportion of homozygous dominants, heterozygotes, and recessives for given initial proportions.—*Sewall Wright.*

205. Tedin, Hans. **Eine mutmassliche Verlustmutation bei Pisum. [A probable loss-mutation in Pisum.]** Hereditas **4:** 32–43. *1 fig.* 1923.—From "Early Britain" field pea, a number of races were established at Svälof by selection, among tham Schroterbse, a variety with red blossoms, indented seed with grayish-brown seed coat, which was introduced into the trade in 1906, and 0301 which differed from it in having smooth seed with colorless seed coat. Cultivation of the latter was discontinued in 1899; nevertheless it reappeared in 1910 in newly established elite of Schroterbse. Its inheritance was then studied by crossing with Schroterbse and the old 0301. It proved to be simple recessive identical with the old 0301. The author discusses its reappearance and concludes that it must have arisen by loss-mutation. The article includes a discussion of blossom color, seed-coat color, and seed-form inheritance in *Pisum arvense.*—*R. E. Clausen.*

206. Tedin, Olof. **The inheritance of pinnatifid leaves in Camelina.** Hereditas **4:** 59–64. *1 fig.* 1923.—Two forms of *Camelina*, differing from each other in almost every important character, were found to give constant progeny. One form had pinnatified and the other entire leaves, scantily denticulated. Crosses were made between the 2, and between the pinnatifid and another entire race from the Hortus Bergianus of Stockholm in order to study the inheritance of leaf shape. F_1 was intermediate, but more like the pinnatifid parent; F_2 exhibited complex segregation difficult of accurate classification; but in conjunction with F_3 results, a 2-factor interpretation, in which $AABB$ = pinnatifid, $aabb$ = entire, and 2 new types, $AAbb$ = pinnatifid with shorter and broader lobes than $aaBB$, and $aaBB$ = deeply dentate, was found to fit the results. In F_2, AA plants were found to be significantly shorter than those of the aa classes.—*R. E. Clausen.*

207. Tischler, G. **Mutation im Pflanzenreich. [Mutations in the plant kingdom.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg **78:** 20–21. 1922.—This summary of a general lecture briefly traces the history of the mutation concept.—*Orland E. White.*

208. Wentworth, Edward M., and Jay L. Lush. **Inheritance in swine.** Jour. Agric. Res. **23:** 557–582. *2 pl.* 1923.—The paper gives the results of an extensive series of experiments with swine. The erect ear of the Berkshires was found to be dominant over the drooping ear of the Duroc-Jersey by at least 1 and probably not more that 3 principal factors. There were indications that neither breed was homozygous for its own peculiar ear shape. An association between type of ear and quality of the animal was observed among the Duroc-Jerseys, a large, extremely flabby ear usually being found with animals showing general roughness and lack of quality. The long straight face of the wild boar and the Tamworth was found to be completely dominant over the short, dished face of the Berkshire. On the other hand in crosses between Berkshire and Duroc-Jersey, the latter intermediate in the above respects, the F_1 pigs approached the Berkshire type. There was much wider variation in F_2, clearly indicating segregation of a small number of factors. All combinations of degree of dish and

length of face were found in F_2, except that hogs with extremely dished and extremely long faces did not occur. With regard to color: wild (striped agouti) × Tamworth (self red) produced only striped red and brown pigs, 38 in number. Four F_2 pigs were all striped but showed segregation in color of belly, red and white. In a back cross to a Tamworth sow, there was segregation of striping (5 striped, 3 not striped). Two of these as well as 1 of the F_2 pigs showed black spots on the belly. Wild × Berkshire (black with white points) produced 17 F_1 pigs like the Wild × Tamworth in color except for less of the reddish tinge and the presence of large black spots. Berkshire × Tamworth produced 10 F_1 pigs, of which 8 were red with small black spots and 2 were self-red. Berkshire × Duroc-Jersey (self red) produced 29 F_1 pigs all yellowish red, fading to sandy, with small black spots. Exactly $\frac{1}{4}$ of 148 F_2 pigs and about $\frac{1}{2}$ of 35 back crosses to Duroc-Jersey showed no black spotting, indicating segregation of a unit factor. The amount of black in the others in F_2 varied, however, from a few small spots nearly to the Berkshire pattern. The back cross pigs all showed red, but in F_2 there was segregation of intensity of red, 87 showing red, 31 sandy, and 30 white. Many of the reds and sandies were bi-colors with a lighter color on the belly or in a roan pattern, or as a ground color to spots of the more intense color. It is suggested that 2 factors are primarily responsible for the differences between red, sandy, and white. A strong negative correlation between amount of black in the spots and intensity of red was noted. A few light bellied reds or sandies with stripes like the pigs of the wild boar appeared in F_2 and F_3. In regard to growth, it was found that F_2 was distinctly more variable at every month's weight than F_1. Study of the rudimentary mammae revealed sex differences but did not agree fully with the hypothesis of sex-limited inheritance previously advanced by the senior author. They agreed still less with the hypothesis of sex linkage.—*Sewall Wright.*

209. Wright, Sewall. **The effects of inbreeding and crossbreeding on guinea pigs. III. Crosses between highly inbred families.** U. S. Dept. Agric. Bull. 1121. *61 p. 27 fig.* 1922.—Crosses have been made among the inbred families of guinea pigs at the Bureau of Animal Industry. These have resulted in a marked improvement over the parental stocks in every respect. This improvement appears to its full extent in the progeny of the 1st cross in the case of adult weight (about 12 per cent improvement), and in resistance to tuberculosis (about 20 per cent). Mortality between birth and weaning was found to depend about $\frac{3}{4}$ on the breeding of the young, and $\frac{1}{4}$ on that of the dam. In rate of gain between birth and weaning, the breeding of the dam and of the young are about equally important. An improvement of 16 per cent was obtained in this respect. Birth weight depends about $\frac{3}{4}$ on the dam, and $\frac{1}{4}$ on breeding of young. Mortality at birth is almost wholly a maternal affair. Cross-breeding of the dam adds about 7 per cent to the chances of the young. Heredity of the young counts for nothing in frequency or size of litter. The sire is somewhat more responsible for the former; the dam wholly for the latter. Number of young raised per year by an average mating depends on: mortality at birth, that between birth and weaning, and frequency and size of litters. These combined give an increase of 80 per cent in superiority among the cross-breds over the inbreds. Analysis of crosses indicates that results are all direct or indirect consequences of the Mendelian mechanism of heredity. The author believes that the results point the way to an important application of inbreeding in improvement of livestock. By starting a large number of inbred lines, important hereditary differences are brought to light and clearly fixed. Crosses among these lines ought to give full recovery of whatever vigor was lost by inbreeding, and particular crosses may safely be expected to show a combination of desired characters distinctly superior to the original stock.—*E. E. Jones.*

HORTICULTURE

J. H. Gourley, *Editor*
John Bushnell, *Assistant Editor*

(See also in this issue Entries 48, 50, 109, 110, 128, 255, 258, 260, 302, 331, 335, 375, 417, 439, 443, 495, 500, 504, 521, 599, 616)

FRUITS AND GENERAL HORTICULTURE

210. Anonymous. **Pruning young apple trees for balance.** New Zealand Jour. Agric. **26:** 310–312. *3 fig.* 1923.

211. Barker, B. T. P. **West Country orchards and their possibilities.** Jour. Bath and Western and Southern Counties Soc. **17:** 45–57. 1923.—The author discusses the possibilities for development of farm orchards as contrasted with commercial orchards. He considers that the most profitable varieties are vintage fruits rather than dessert fruits, by reason of their lesser demand upon time and attention of the grower. A list is given of cider varieties desirable for planting in the West of England.—*Joseph S. Caldwell.*

212. Bartlett, Reg. G. **The cultivation of the bush nut.** Agric. Gaz. New South Wales **34:** 528. 1923.—This tree (*Macadamia ternifolia*) is native in Queensland. It is known also as Polar or Australian nut. The nuts are of superior quality and are used in confectionery. The tree bears poorly in its natural habitat, but becomes prolific under cultivation. Trees begin bearing in 4–7 years from seed. Bearing trees return $2.50–$10 per acre.—*L. R. Waldron.*

213. Barton, F. J. **High yields of strawberries.** Better Fruit 17^{10}: 7. 1923.—Cultural practices are briefly given by a successful grower of long experience. Ettersburg 121 was found to be the best canning berry and Hilcrest, a hybrid between Oregon and Dunlap, the choicest table variety.—*A. E. Murneek.*

214. Brereton, W. le Gay. **Pruning young deciduous fruit trees. Comparative advantages of the stopped and the unstopped leader.** Agric. Gaz. New South Wales **34:** 509–518. *8 fig.* 1923.—Cutting back young deciduous fruit trees is recommended. This process is often advisable during the developing years because the average tree does not naturally assume a commercially economical form. Topping back upright growers increases tree spread and number of shoots for later limb production. Topping precocious croppers avoids sagging or serious breakage. Annual topping back should be continued until a suitable framework has been established. Its cessation depends on tree development rather than age of tree. Certain pear and plum varieties when grown under the light, coastal soil conditions have not responded favorably to topping. It is often advisable to cease topping cherry trees because of gumming habit. With certain apple varieties, e.g., Jonathan, it is generally not wise to leave main leaders untopped for a very long period even after the framework has developed, for by so doing it soon slackens vegetative growth and fruit size is reduced.—*L. R. Waldron.*

215. Burkill, I. H. **Annual report of the Director of Gardens, Straits Settlements, for the year 1922.** Straits Settlements Gov. Gaz. **58:** No. 30. Supplement. June 1, 1923.—The report includes a list of the seeds and plants introduced and propagated and a list of those distributed. Species flowering and fruiting for the first time are mentioned.—*R. C. Holttum.*

216. Burtner, John C. **Latest cherry pollination studies.** Better Fruit 18^{2}: 5–6, 23–24. 1923.—Extensive experiments conducted recently in Wasco county, Oregon, by the Oregon Agricultural Experiment Station have shown that the 3 main commercial varieties of sweet cherries, Royal Ann (Napoleon), Bing, and Lambert, are both self and inter-sterile. They may be successfully pollinated by several other varieties of sweet cherries. The best for this purpose are Black Republican, Long Stemmed Waterhouse, and Norma. Individual trees within a variety vary in their ability to fertilize other varieties, hence in propagation only scion wood from tested trees should be used. Cherry pollen is not carried by wind to any distance. In the absence of wild insects bees must be provided to insure proper pollination. A detailed review of the history of pollination studies by the Oregon Station is given. A table of results of pollination tests for 1922 and 1923 is appended.—*A. E. Murneek.*

217. Childs, LeRoy. **Development of spray practices.** Better Fruit 17^8: 5–6, 24–25; 17^9: 14, 16–17, 27. 1923.—Extensive dusting experiments conducted by the Hood River Branch Agricultural Experiment Station show that the continued winds occurring during the spring make dusting for controlling apple scab and codling moth impracticable. Tests of the comparative value of spray gun and spray rod show that the gun requires much greater pressure for efficient work. On the usual 3½ horse power outfit only 1 gun should be used. Moreover, a disk that permits the discharge of no more than 5 gallons per minute must be inserted in the nozzle, and the pressure maintained at 300–325 pounds.—*A. E. Murneek.*

218. Cole, F. W. **Topworking and bridge grafting.** Better Fruit 17^9: 5–6, 20. 1923.—The King, Black Twig, Ben Davis, Alexander, and Greening apple varieties are reputed to be easily top grafted, while Duchess, Grimes, and Gravenstein do not lend themselves readily to this practice. The Coburn and Koeuf seem by far the best methods for top-working older trees. Detailed procedure of top-grafting fruit trees by the above and other methods is given. —*A. E. Murneek.*

219. Currin, C. J. **Pruning the apple tree.** Better Fruit 17^7: 13–14. 1923.

220. Dean, M. L. **Nut growing in the Northwest [U. S. A.]** Better Fruit 17^4: 16–17, 26. 1922.

221. Duruz, W. P. **Handling California fruit for shipment.** Better Fruit 17^5: 5–6, 22–23. 1922.

222. Eckert, W. O. **Grapes in the Sound country [U. S. A.]** Better Fruit 15^5: 7–8, 24. 1922.—Grapes mature around Puget Sound, Washington, if grown in sheltered spots. The Island Belle has been most satisfactory for this section, reported to ripen under the most adverse conditions. Other varieties that may be tried are: Eclipse, Green Mountain, and Vergennes. The usual recommendations are given for selecting a site, setting out, and maintaining a small vineyard. Because of danger from frosts the fruit is often packed prematurely, though most of the varieties, particularly Island Belle, are not injured by even a severe frost. Prevalent fall rains frequently delay picking.—*A. E. Murneek.*

223. Esbjerg, Niels. **Forsög med Plantealderens Indflydelse paa Baerudbyttet af Ribsbuske.** [Experiments on influence of age on the bush and yield of currants.] Tidsskr. Planteavl **28**: 834–839. 1922.

224. Geary, A. M. **Selling the boxed apple abroad.** Better Fruit 17^3: 5–6, 25. 1922.—The author emphasizes the need of proper refrigerator space on steamers carrying fruit from Pacific Northwest ports.—*A. E. Murneek.*

225. Grubb, N. H., and G. S. Peren. **Raspberry nomenclature.** Jour. Bath and Western and Southern Counties Soc. **17**: 203–206. 1923.—Material in variety collections at East Malling and Long Ashton, obtained from market growers and nurserymen, was studied. Very great confusion as to nomenclature exists, the plants supplied under a given variety name often included plants of 3 or more varieties and in some cases no one variety constituted as much as 50 per cent of the plants. Each of 14 well known varieties was supplied by various nurserymen under 2–7 different names. The causes of this confusion are discussed. The growth of seedlings from fallen fruits and the suppression of weak-growing varieties by more vigorous seedlings, together with carelessness, are the principal factors. Bud sporting from roots, while occurring occasionally, is not sufficiently frequent to cause confusion.—*Joseph S. Caldwell.*

226. Hall, T. R. **Disease factor in commercial pomology.** Better Fruit 17^2: 5–6, 18. 1922.—Various factors related to disease of packed fruit are discussed in detail. Emphasis is placed on time of packing. In general more mature fruit is more readily affected by disease during transportation and storage. All injuries in picking, handling, packing, and shipping should be avoided. The temperature at which fruit (particularly soft fruit) is harvested, packed, and shipped is closely correlated with the amount of loss from various diseases. As a rule the lower the temperature the less injury from disease. Wrappers are very effective in preventing the spread of disease to adjoining fruit. Beside temperature, humidity, ventilation and other factors are of importance in determining physiological decay of most fruits.—*A. E. Murneek.*

227. Haseman, L., and K. C. Sullivan. **Controlling San Jose scale with lubricating oil emulsion.** Missouri Agric. Exp. Sta. Circ. 109. *4 p.* 1923.

228. Heppner, Myer J. **Rootstocks used by California nurserymen during 1922.** Nation. Nurseryman 31[8]: 203–204. 1923.—A report is presented on the replies to a questionnaire sent to California nurserymen. It shows a change in attitude since 1917 toward the value of various rootstocks. Almond is favored for the almond, Mazzard for cherry, Calleryana is gaining in favor for pears and peach and Myrobalan stock for the apricot.—*J. H. Gourley.*

229. McNary, R. G. **Shipping Clark seedless berries.** Better Fruit 17[12]: 12. 1923.—This seedling strawberry, one of the most popular varieties in the Pacific Northwest and practically the only variety grown in the Hood River Valley, Oregon, is being shipped successfully in carloads, if properly handled, to distant eastern and southern markets.—*A. E. Murneek.*

230. Manuel, H. L. **The "Yema" budded vine. A comparison with bench-grafted and spring field-grafted stocks.** Agric. Gaz. New South Wales 34: 449–451. *2 fig.* 1923.—"Yema" budding is done from mid-January until March. The bud remains dormant until spring and thus has the advantage of a full growing season. The advantage of this method over certain others is obvious. An experienced man can bud and tie 400 vines per day. [See also Bot. Absts. 9, Entry 287.]—*L. R. Waldron.*

231. Pearcy, Knight. **Filbert and walnut locations.** Better Fruit. 17[10]: 9–10. 1923.—Walnut should be planted in deep, rich, well-drained soil. Filberts are more tolerant of a wet soil. The lower foot hills of the Willamette Valley, Oregon, are well adapted for both walnut and filbert culture. Prune, peach, and sour cherry are good fillers for walnut orchards.—*A. E. Murneek.*

232. Petri, L. **Alcune considerazioni sul rapporto fra condizioni colturali e produttività dell'olivo. [The relation between cultural conditions and the yields of the olive.]** Staz. Sper. Agrar. Ital. 56: 145–151. 1923.—This note is prompted by an article by Occhialini (Oleum 1: 93. 1922). Emphasis is laid on the fact that care, fertilization, moisture, etc., change a plant bearing a large proportion of male flowers into one with a balance between staminiferous and perfect flowers. The author concludes therefore, that in a region like Italy where the olive has been selected for its high productivity, it can not be assumed that a preponderance of staminiferous flowers is an ontogenetic phenomenon, but that it should be considered mostly a question of nutrition.—*A. Bonazzi.*

233. Read, C. A. **Filbert culture and varieties.** Better Fruit 17[1]: 9, 18–19; 17[2]: 20–23. 1922.

234. Savastano, G. **La biologia colturale del limone sul versante orientale etneo. [Cultural biology of the lemon on the eastern slope of the Etna.]** Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale 6: 1–52. *Pl. 1–4.* 1922.—In this cultural guide for local use the following subjects are considered; history, biology, geographic distribution, biology of the flowering and fruiting plant, longevity, the nursery, grafting, soil systematization previous to planting, windbreaks, pruning, cultural practices, fertilization and irrigation, second flowering, diseases, parasites, and injuries.—*A. Bonazzi.*

235. Savastano, L. **Della coltivazione dell' anona in Italia. [The cultivation of Anona in Italy.]** Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale 7: 1–32. *Pl. 1–4.* 1923.—This is a study of the cultural and market possibilities of *Anona Cherimolia* Mill. in Italy, where at present it is not grown. A number of letters are given showing the cultural practices in the Canary Islands, Spain, Peru, Mexico, and Cuba. The object of the study is to obtain a cultural practice adapted to the Italian peninsula.—*A. Bonazzi.*

236. Sears, F. C. **Quince culture in Massachusetts.** Better Fruit 18[1]: 5–6; 18[2]: 13, 15. 1923.

237. Shaw, J. K. **Possibilities of nursery tree certification.** Nation. Nurseryman 31[8]: 201–202. 1923.—The author estimates that approximately 10 per cent of the nursery trees shipped into New England are not true to name, involving large annual losses. The author inaugurated a plan for certifying 2-year old trees while yet standing in the nursery. A lead seal inserted in a branch states the variety, year of inspection, and by whose authority the work is done. It offers a solution for one of the most serious difficulties and its voluntary adoption by nurserymen is recommended.—*J. H. Gourley.*

238. Summers, F. **Factors governing fruit bud formation V. Further experiments upon the ringing and notching of fruit trees.** Jour. Bath and Western and Southern Counties Soc. 17: 140–144. 1923.—In ringed shoots of cherry, apple and pear, development of buds was retarded above the ring, accelerated for some distance below it. Similar but very much less marked effects were obtained with plum shoots. Slitting the bark longitudinally produced no effects.—*Joseph S. Caldwell.*

239. Tufts, Warren P., and Myer J. Heppner. **The identification of deciduous fruit tree root stocks.** Nation. Nurseryman 31^8: 207–208. 1923.—This is an outline of methods used in determining the kind of root stock employed in fruit tree propagation, by means of morphological characters and histological evidence.—*J. H. Gourley.*

240. Wallace, T. **Pot experiments on the manuring of fruit trees.** Jour. Bath and Western and Southern Counties Soc. 17: 168–183. 1923.—Experiments are reported with apple, gooseberry, currant, and strawberry, grown in pots of sand watered with complete nutrient solution and with the same minus one of the constituents: nitrogen, potash, phosphoric acid, calcium, or magnesium. Data as to shoot growth, amount and condition of foliage, condition of buds, character of root systems, and amount of weight increase for each treatment are given for the various series, but no conclusions are drawn.—*Joseph S. Caldwell.*

241. Weyrauch, P. H. **Prune industry in Washington.** Better Fruit 17^2: 11–12. 1922.

242. White, E. C. **Developing cultivated blueberry.** Better Fruit 17^6: 5–6, 18–20, 22. 1922.—Detailed procedure in improving the wild blueberry by cooperative work of the writer and F. V. Coville is popularly discussed. By selection and cross-breeding several improved plants have been obtained. Some of these promise to be of commercial value. Cultural and marketing methods are briefly discussed.—*A. E. Murneek.*

243. Wood, E. G. **Goals for apple orchard production.** Better Fruit 17^4: 9–10, 20. 1922.—Summarizing the results of the investigations in yields of apple trees (U. S. Dept. Agric. Bul. 446) and the comparatively recent data compiled by the Wenatchee Valley Traffic Association, the writer concludes that yield of trees increases rapidly to the 9th year after planting, then gradually decreases. While exhaustion of soil humus and nitrogen may be largely responsible, the largest factor in many cases is too close planting. Data are given purporting to show that trees 40 feet apart will bear as heavily per acre as when planted 30 feet apart. A careful study of high-yielding orchards suggests the necessary changes in management to increase the crop. Growers in the Wenatchee and Yakima Valleys, Washington, should obtain 600 boxes per acre from trees more than 9 years old; for the less favorable Walla Walla district and the Spokane Valley, Washington, the goal should be 500 and 400 respectively.—*A. E. Murneek.*

244. Wood, E. G. **Profits and benefits of thinning.** Better Fruit 17^1: 5–6, 22–24. 1922.—Systematic yearly thinning prevents wasting of vitality of the tree and the acquiring of the habit of biennial bearing. Thinning of fruit should be done as early as possible; the most convenient time, however, is immediately after the "June drop." The result is larger fruit of higher grade. Fruits thinned to 1 in a place are more easily covered by spray. Pears when thinned will reach the required size sooner and hence may be picked a week earlier. Data giving the approximate results and benefits that have accrued from thinning apples in 2 orchards in Washington are introduced.—*A. E. Murneek.*

VEGETABLE CULTURE

245. Pinn, A. J. **An aspect of vegetable growing on the coast.** Agric. Gaz. New South Wales 34: 519–520. 1923.—On the light, coastal soils as much as 20 tons of farmyard manure can be applied per acre during the early preparation of the land. Supplementing this, no more than 300 pounds per acre of superphosphate is required. It is estimated that the fertilizing material in each ton of manure would cost nearly $3 if purchased in the form of mineral fertilizers.—*L. R. Waldron.*

246. Rosa, J. T., Jr. **Better methods of tomato production.** Missouri Agric. Exp. Sta. Bull. 194. *22 p.* 1922.

247. Rosa, J. T., Jr. **The home vegetable garden as a business proposition.** Missouri Agric. Exp. Sta. Bull. 193. *15 p.* 1922.

HORTICULTURAL PRODUCTS

248. Anonymous. **Experiments in drying whole apricots.** Agric. Gaz. New South Wales 34: 508. 1923.

249. Barker, B. T. P., and Otto Grove. **Cider-making experiments with culinary and dessert apples.** Jour. Bath and Western and Southern Counties Soc. 17: 199–203. 1923.—Analyses (specific gravity, acid and tannin content) are reported for 7 dessert and 9 culinary varieties, and methods of blending with vintage fruit are suggested whereby fermented ciders of good quality may be made.—*Joseph S. Caldwell.*

250. de Castella, F. **Preliminary maceration. A new wine-making development.** Jour. Dept. Agric. Victoria 20: 36–44. 1922.

251. Garino-Canina, E. **Indagini sperimentali sul moscato di Canelli.** [An experimental inquiry on the production of Moscato wine from Moscato grapes.] Staz. Sper. Agrar. Ital. 56: 26–66. *Fig. 1.* 1923.—This is a compendium of the technical practices of wine production and the underlying scientific bases. The grapes of the Moscato type are studied as to physical and chemical characters and each step in Moscato wine production is critically studied. Investigations are reported on the fate of the nitrogen compounds of the must, during the primary and the secondary, or ripening, fermentation; their effect upon and relation to the type and intensity of the secondary fermentation; and the composition, excluding CO_2, of the various wines.—*A. Bonazzi.*

252. Grove, Otto. (1). **Cider-making trials for the season 1921–2.** Jour. Bath and Western and Southern Counties Soc. 17: 208–213. 1923. (2). **The composition of vintage apples in 1921.** Ibid 17: 213–218. 1923.—Specific gravity, acid and tannin content of juices are given for 130 varieties of apples grown in the exceptionally hot, dry season of 1921. The specific gravity of all juices was exceptionally high and the characteristic flavors of the different varieties was less pronounced than in normal years. The fruit was markedly undersized. *Joseph S. Caldwell.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 327, 332, 334, 340, 378, 466, 485, 496, 543, 554, 555, 596)

253. Arber, A. **On the development and morphology of the leaves of palms.** Proc. Roy. Soc. London B 93: 249–261. 1922.—Palm leaves of both fan and feather types are developed from the upper region of the leaf-stalk, arising from series of invaginations—not foldings—which penetrate the tissues of this organ. The development falls in line with that of leaves of other monocotyledons, the palm leaf being regarded as a petiolar phyllode. The blade is thus a pseudo-lamina analogous to, but not homologous with, the dicotyledonous blade.—*P. B. Sears.*

254. Bugnon, P. **Sur les homologies des feuilles cotylédonaires.** [The homology of cotyledonary leaves.] Compt. Rend. Acad. Sci. Paris 176: 1732–1734. *Fig. 1–3.* 1923.—A study is made of certain of the Papilionaceae, especially *Lupinus angustifolius.* It is concluded that the cotyledons can be interpreted in this and other lupines as the phyllodes of leaf traces.—*C. H. Farr.*

255. Coupin, Henri. **Sur la nature morphologique de la "pomme" des Choux-fleurs.** [On the morphological nature of the tuber of the Chou-fleur.] Compt. Rend. Acad. Sci. Paris 176: 1176–1178. 1923.—The tuber of *Brassica oleracea* var. *Chou-fleur* is formed by the stem, through arrested development. This is a teratological abnormality and is not due to a parasite. It is found to contain stem tissue.—*C. H. Farr.*

256. Fürth, Paula. **Zur Biologie und Mikrochemie einiger Pirola-Arten.** [On the biology and microchemistry of several species of Pirola.] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. 129: 559–587. *9 fig.* 1920 [1922].—Observations on the natural reproduction, seed anatomy, and mycorrhizae of *Pirola secunda, P. chlorantha, P. minor,*

and *P. uniflora* are given. Seedlings are extremely rare in all species, the natural mode of reproduction being by runners or root branches. A single seedling of *P. chlorantha*, and a structure of *P. uniflora* corresponding to Velenovsky's hypothetical procaulm were found in nature. All efforts to germinate the seed failed. Anatomically the seeds of all species are similar and consist of an undifferentiated embryo inclosed within an endosperm of a single layer of cells, surrounded loosely by a testa.—There is present in each species an endotrophic and obligatory mycorrhiza, the fungus component of which is usually limited to the root epidermis where it causes marked hypertrophy. Attempts to obtain the fungus in pure culture failed; although it grew readily on agar plates it was always accompanied by numerous bacteria, and succumbed in attempts at aseptic treatment.—A readily crystallizable organic substance of unknown nature is characteristically present in the aerial parts of *P. uniflora*, and phloroglucotannoids are present in all 4 species.—A peculiar form of chromatophore in the leaf epidermis of *P. chlorantha* is described.—*F. Weiss.*

257. Harper, R. A. **The species concept from the point of view of a morphologist.** Amer. Jour. Bot. **10:** 229–233. 1923.—The author emphasizes the value of the species concept in the study of evolutionary phylogeny. Linnean species are generally good phylogenetic units and the term species should be reserved for them. A recognition of lesser units is of importance in many fields of investigation. The aim of classification is to bring all these units into their proper evolutionary sequence.—*E. W. Sinnott.*

258. Harshberger, John W. [Rev. of: Tubeuf, Karl von. **Monographie der Mistel. [Monograph of the mistletoe.]** *xii + 832 p, 35 pl., 179 fig.* R. Oldenbourg: Munich and Berlin, 1923 (see Bot. Absts. 12, Entry 6694).] Torreya **31:** 53–54. 1923.

259. Hauser, Robert. **Untersuchungen an Makrogametophyten von Piperaceen. [Researches on the macrogametophytes of the Piperaceae.]** Beitr. Allg. Bot. **1:** 115–149. *Fig. 1–39.* 1918.—The plants studied were *Peperomia magnoliifolia*, *P. marmorata*, *P. blanda*, *P. resediflora*, and *Piper subpeltatum*. A study was made of the position and development of the nucellus and integument, of the characteristic stages of reduction division in the embryo-sac mother cell, of the accompanying processes in the cytoplasm, on the organization of the gametophytes, and of fertilization.—*Orton L. Clark.*

260. Huber, Bruno. **Zur Biologie der Torfmoororchidee Liparis Loeselii Rich. [The biology of the turf-moor orchid Liparis Loeselii.]** Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. **130:** 307–328. *11 fig.* 1921 [1923].—*Liparis Loeselii* inhabits grassy moors where the surface layer is poor in nitrogen and has a nearly neutral reaction. The plants are invariably found associated with a fungus which permeates the bulb-like stem outside the circle of vascular bundles and, to a lesser extent, the leaf bases and roots. Infection of the new axis occurs each year through the principal root which penetrates the old leaf sheath; migration of the fungus from the old axis does not occur. During the growing season the fungus degenerates and apparently is digested in the host cells. It forms chains of conidia in the root epidermis and leaf base.—Both components of the symbiosis can be cultivated separately, but the orchid does not thrive or come to bloom. However, starch is formed in sunlight and active transpiration occurs.—The fungus is of the type of *Rhizoctonia repens* Bernard and *Orcheomyces psychodis* Burgeff, but is designated *O. Loeselii*. The less highly oxidized forms of nitrogen such as urea, peptone, and amino-acids are most favorable for its culture; it does not utilize atmospheric nitrogen. The fungus derives its carbohydrate—starch in this case—from the orchid and furnishes the latter with some of its nitrogen. Seed germination failed but the plant can be propagated from adventitious buds.—*F. Weiss.*

261. Mattfeld, Johannes. **Zur Kenntnis der Phylogenie unterständiger Fruchtknoten bei den Caryophyllaceen. [A phylogenetic investigation of the inferior ovary in the Caryophyllaceae.]** Ber. Deutsch. Bot. Ges. **39:** 275–280. 1921.—In the young flowers of *Minuartia sclerantha* and sometimes of the genus *Scleranthus*, the ovaries are almost completely sunken in the receptacle, so that the tip of the ovary is at a level with the insertion point of the stamens. As the fruit matures the depression in the receptacle widens but does not deepen, so that the ripe fruit rests only with its spherical base in the hollow of the receptacle. There are flowers, however, in which the growth in width of the receptacle does not keep pace with the growth in width of the capsule, resulting in a compression of the lower part of the

fruit, the upper part developing freely and attaining a larger diameter than the part enclosed by the receptacle. In related forms, as *M. hispanica* and *M. hamata*, there is hardly a trace of a depression of the receptacle. This investigation is of interest in indicating the manner of development of the inferior ovary and in throwing light on the phylogeny of the Scleranttheae and the Alsineae. *Scleranthus* has evidently been derived from *Euminuartia*, both *Scleranthus* and *Minuartia* being final stages in a long line of development. The hardening of the calyx base in *Scleranthus* had already proceeded before the new character—the lowering of the ovary in the hollow of the receptacle—was accomplished. This new character did not fit in with existing conditions, and this is the reason for the differences shown by the individual flowers. It seems certain that the Sclerantheae have their nearest relatives among the Alsinoideae of Asia Minor.—*C. L. Wilson.*

262. Neumann-Reichardt, Ernst. **Anatomisch-physiologische Untersuchungen über Wasserspalten. [Anatomical-physiological studies on water pores.]** Beitr. Allg. Bot. **1:** 301–352. *Pl. 7–12.* 1918.—A study is reported of the anatomy of the water pores of a large number of plants with several plates of carefully drawn figures of many types. The relation of water pores to stomata is discussed, as well as certain phases of the physiology of the former.—*Orton L. Clark.*

263. Pfeiffer, H. **Der heutige Stand unserer Kenntnisse von den Kegelzellen der Cyperaceen. [Our present knowledge of siliceous cells in the Cyperaceae.]** Ber. Deutsch. Bot. Ges. **39:** 353–364. 1921.—Siliceous cells are found, with but few exceptions, in all genera of the Cyperaceae. They have no physiological significance, but are important taxonomically.—*Ernst Artschwager.*

264. Rasch, Walter. **Über den anatomischen Bau der Wurzelhaube einiger Glumifloren und seine Beziehungen zur Beschaffenheit des Bodens. [On the anatomical structure of the root-cap of certain grasses and its relation to soil texture.]** Beitr. Allg. Bot. **1:** 80–114. *Pl. 2–3, fig. 1–20.* 1918.—Anatomical studies showed with 16 out of the 30 species examined an unusual development of the root-cap, the cell walls being very strong, thick, and showing many pits. This type of root-cap occurred mainly on xerophytic forms. Cultural experiment showed that dryness and the mechanical condition of the soil have a direct influence on the formation of these thickened cell walls of the root-cap.—*Orton L. Clark.*

265. Rimbach, A. **Über Wurzelverkürzung bei dikotylen Holzgewächsen. [Shortening of roots in woody dicotyledons.]** Ber. Deutsch. Bot. Ges. **39:** 281–284. 1921.—A small number of woody dicotyledons exhibit a contraction of the main root and the larger lateral roots as long as the tissue of the root is still succulent. The contraction is commonly small, but in *Moringa pterygosperma* it may amount to 75 per cent for certain regions. The root of *Moringa*, as well as the roots of other plants, thicken while contracting. The adventitious prop roots of the genus *Cecropia* contract between 1 and 5 per cent when the roots become anchored in the soil. As a result of this contraction the root straightens and becomes rigid.—*C. L. Wilson.*

266. Rimbach, A. **Über die Verkürzung des Hypokotyls. [Shortening of the hypocotyl.]** Ber. Deutsch. Bot. Ges. **39:** 285–287. 1921.—The aerial hypocotyl of many dicotyledonous seedlings which later develop a fleshy tap-root becomes a part of the root, and as the tissue changes take place the actual length of the hypocotyl, like that of the root, becomes less, due to the contraction of the organ. The degree of contraction may be considerable, amounting to 60 per cent in *Mirabilis jalapa* and 40 per cent in *Medicago sativa.*—*C. L. Wilson.*

267. Rimbach, A. **Über die Wachstumsweise der Wurzel von Incarvillea Delavayi. [Concerning the method of growth in the root of Incarvillea Delavayi.]** Ber. Deutsch. Bot. Ges. **39:** 288–290. 1921.—The writer records the results of his observations on the growth of this herbaceous species of the Bignoniaceae. He found that at the end of the growing season the leaves were dropped, and the fleshy tap-root making up the main body of the plant contracted somewhat, so that the entire plant was buried beneath the surface of the soil. At the beginning of the next period of growth the thick cortex was sloughed off, leaving only a central core of vascular tissue. This cortex was gradually replaced during the growth of the season. Since this species is perennial, the process repeats itself during the life of the plant.—*C. L. Wilson.*

268. Schilling, Ernst. **Über die lokalen Anschwellungen der Bastfasern. [Local swellings in bast fibers.]** Ber. Deutsch. Bot. Ges. **39**: 379–383. 1921.—The bast fibers of certain plants show local dilation, a peculiarity which is of obscure significance. Formation of such local swellings can be induced in flax by sharply bending the stalk. Experiments on the effect of intermittent bending, such as produced by winds, are in progress and the results will be reported in a special paper.—*Ernst Artschwager.*

269. Schürhoff, P. N. **Die Entwicklungsgeschichte von Ilex aquifolium. [Development of Ilex aquifolium.]** Ber. Deutsch. Bot. Ges. **39**: 377–379. 1921.—In its development *Ilex* follows the typical angiosperm type, thus differing from the other families of the Sapindales, which show variations from the normal.—*Ernst Artschwager.*

270. Souèges, René. **Embryogénie des Géraniacées. Développement de l'embryon chez l'Erodium cicutarium L'Herit. [The embryogeny of the Geraniaceae. The development of the embryo of Erodium cicutarium.]** Compt. Rend. Acad. Sci. Paris **176**: 1565–1567. *Fig. 1–23.* 1923.—The main principles involved in the development of this species are the same as for *Geum urbanum* previously described [see Bot. Absts. 12, Entry 2516.]—*C. H. Farr.*

271. Souèges, René. **Embryogénie des Valérianacées. Développement de l'embryon chez le Valerianella olitoria Poll. [Embryogeny of the Valerianaceae. The development of the embryo of Valerianella olitoria.]** Compt. Rend. Acad. Sci. Paris **176**: 1081–1083. *Fig. 1–30.* 1923.—Segmentation in this species is irregular with oblique partitions, thus differing from that in *Lamium purpureum.* The embryogeny of both species resembles that of the Compositae.—*C. H. Farr.*

272. Wendel, Else. **Zur physiologischen Anatomie der Wurzelknöllchen einiger Leguminosen. [On the physiological anatomy of the root nodules of certain Leguminoseae.]** Beitr. Allg. Bot. **1**: 151–189. *Pl. 1, fig. 1–7.* 1918.—A detailed description is first given of the nodules of several legumes. This is followed by an anatomical-physiological study and classification on the basis of Haberlandt's system of the various tissues of the nodules.—*Orton L. Clark.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 101, 257, 293, 339, 355, 374, 391, 490, 624)

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue 97, 257, 374, 490)

273. Andrews, A. LeRoy. **Natural versus artificial classification of the bryophytes.** Bryologist **26**: 25–29. 1923.—Progress toward a system of natural relationships, latterly dominated by the genetic point of view, has been far less rapid in the cryptogamic than in the higher plant groups. The delimitation and interrelationships of groups has been made more successfully for the hepatics than for the true mosses, though even here there are many cases of confusion. It is in the Bryales, however, that the most perplexing problems arise. What, for example, are the true relationships of the cleistocarpous genera and species; and how many and what links join the formerly separate divisions of acrocarps and pleurocarps? Conditions at present are chaotic. Further difficulties are caused by the "dead hand" of former artificial systems, by the tendency to divide cumbersome genera mechanically, and by the fancied necessity of placing in a system devised for the North Temperate Zone the many tropical forms. A natural system can only arise through intensive work upon limited groups, controlled by the perspective of monographic work.—*E. B. Chamberlain.*

274. Chamberlain, Edward B. **Meeting of the Sullivant Moss Society.** Bryologist **26**: 13–15. 1923.—The 12th public meeting of the Society occurred in Boston, Dec. 28, 1922. The article abstracted gives a running account of the papers presented and of the specimens and books exhibited.—*E. B. Chamberlain.*

275. Grout, A. J. **Leucodon julaceus (Hedw.) Sulliv., with flagella.** Bryologist 26: 30. 1923.—The author describes flagelliform branches in *Leucodon julaceus* from material collected by P. O. Schallert at Winston-Salem, North Carolina. Since branches of this character were previously unknown in the species he proposes for the specimens the name forma *flagellifera.—E. B. Chamberlain.*

276. Lorch, Wilhelm. **Die Laubmoose.** [Mosses.] *2nd ed., rev. and enl., (38) + 236 p., 273 fig.* (Kryptogamenflora für Anfänger 5. Lindau, Editor. [Cryptogamic flora for beginners 5].) Julius Springer: Berlin, 1923.—The 1st edition of this work, which is a manual for the ready determination of mosses, particularly those of Germany, appeared in 1914. In this 2nd edition numerous improvements and additions are incorporated. The book is divided into a general part, occupying pages (1)–(38), and a special part, occupying pages 1–236. In the general part the 1st chapter outlines the history of bryology and gives a morphological account of mosses; the 2nd describes the principles upon which the artificial keys of the special part are based; while the 3rd, 4th, and 5th chapters give directions for studying mosses, for carrying out bryological excursions, and for collecting and preserving herbarium specimens. In the special part 652 species are described by means of a series of artificial keys, especial emphasis being laid on characters derived from the gametophyte. Since the method adopted gives no systematic arrangement of the genera and species, the description of species is followed by a synopsis of orders, families, and smaller groups. A list of important bryological works and full indexes bring the book to a conclusion.—*A. W. Evans.*

277. Lorenz, A. **Möller's distribution of mosses in Sweden.** [Rev. of: Möller, Hjalmar. **Lövmossornas utbredning i Sverige. V. Polytrichaceae 1. Catharinaea Ehrh., Psilopilum Brid., Oligotrichum De Lam. & De Cand. och Pogonatum Palis.-Beauv. (The distribution of mosses in Sweden.)** Ark. Bot. 16^3: 1–84. *Pl. 1–2, 14 fig.* 1919 (see Bot. Absts. 13, Entry 279).] Bryologist 23: 46. 1920.—The reviewer points out the fact that most of the mosses discussed by the author occur also in North America but notes that the North American *Catharinaea crispa* James has not yet been found in Sweden.—*A. W. Evans.*

278. Lorenz, Annie. [Rev. of: Möller, Hjalmar. **Lövmossornas utbredning i Sverige. I–IV, VI, VII. (The distribution of mosses in Sweden.)** Ark. Bot. 10^{12}, 12^4, 12^{13}, 15^2, 17^4, 17^{14}: 1911, 1912, 1913, 1917, 1921, and 1922 (see Bot. Absts. 13, Entries 280, 281).] Bryologist 25: 59–60. 1922.—The reviewer comments on the importance of Möller's series of papers to the student of New England mosses, particularly those of Vermont, and calls attention to the relatively great abundance of the Splachnaceae in Sweden.—*A. W. Evans.*

279. Möller, Hjalmar. **Lövmossornas utbredning i Sverige. V. Polytrichaceae 1. Catharinaea Ehrh., Psilopilum Brid., Oligotrichum De Lam. & De Cand. och Pogonatum Palis. Beauv. [The distribution of mosses in Sweden.]** Ark. Bot. 16^3: 1–84. *Pl. 1–2, 14 fig.* 1919.—In the series of papers of which the present is the 5th, the author discusses the distribution of mosses in Sweden in great detail, his studies being largely based on the comprehensive collections preserved in the herbarium of the Royal Natural History Society at Stockholm and in other Swedish herbaria. Under each species and variety he gives full notes of a nomenclatorial and historical character and occasionally a short description, following these with an enumeration of the specimens examined arranged according to the 29 political divisions of the country. The first 4 numbers of the series were published in the Arkiv för Botanik, as follows: I. Splachnaceae, in 1911; II. Cryphaeaceae och Neckeraceae, in 1912; III. Thuidiaceae, in 1913; and IV. Leskeaceae och Pterogoniaceae, in 1917. In the present number the consideration of the Polytrichaceae is begun, the following species and varieties being recognized as Swedish: *Catharinaea tenella* Röhl., *C. angustata* Brid., *C. undulata* (L.) Web. & Mohr, *C. undulata* var. *minor* (Hedw.) Web. & Mohr, *C. Hausknechtii* (Jur. & Milde) Broth., *Psilopilum laevigatum* (Wahlenb.) Lindb., *Oligotrichum incurvum* (Huds.) Lindb., *Pogonatum polytrichoides* (L.) Brockm., *P. polytrichoides* var. *longisetum* (Hampe) comb. nov. (based on *P. nanum* var. *longisetum* Hampe), *P. nanum* (Weis), proposed as a new combination (*P. nanum* Pal.-Beauv. being included among the synonyms of *P. polytrichoides*), *P. nanum* var. *minimum* (Crome) comb. nov. (based on *Polytrichum minimum* Crome), *P. capillare* (Michx.) Brid., *P. urnigerum* (L.) Pal.-Beauv., *P. urnigerum* vars. *humile* (Wahlenb.) Brid. and *subintegrifolium* (Arnell & Jensen) comb. nov. (based on *Polytrichum urnigerum* var. *subintegri-*

folium Arnell & Jensen). The plates illustrate the anatomical leaf-structure of the various species and the text figures give diagrammatic representations of their distribution. [See also Bot. Absts. 13, Entry 277.]—*A. W. Evans.*

280. Möller, Hjalmar. **Lövmossornas utbredning i Sverige. VI. Polytrichaceae 2. Polytrichum Dill. [The distribution of mosses in Sweden.]** Ark. Bot. 17[4]: 1–125. *Pl. 1–3, 24 fig.* 1921.—The general character of this series is outlined above (see preceding entry). In the present number the treatment of the Polytrichaceae is brought to a conclusion, the large genus *Polytrichum* being considered. The following species and varieties are recorded as members of the Swedish flora: *P. alpinum* L., *P. alpinum* vars. *voraginum* var. nov., *silvaticum* (Menz.) Lindb., *campanulatum* (Hornsch.) Ångstr., *septentrionale* (Sw.) Lindb., and *simplex* Schimp., *P. gracile* Menz., *P. gracile* var. *anomalum* (Milde) Limpr., *P. attenuatum* Menz., *P. attenuatum* vars. *pallidisetum* (Funck) comb. nov. (based on *P. pallidisetum* Funck) and *brevicaule* var. nov., *P. decipiens* Limpr., *P. Swartzii* Hartm., *P. Swartzii* var. *nigrescens* (Warnst.) Hagen, *P. Jenseni* Hagen, *P. commune* L., *P. commune* vars. *uliginosum* Hüben., *minus* Weis, and *perigoniale* (Michx.) Bruch & Schimp., *P. juniperinum* Willd., *P. juniperinum* var. *alpinum* Schimp., *P. strictum* Banks, *P. strictum* var. *alpestre* (Hoppe) Rabenh., *P. pilosum* (Weis) Neck., *P. pilosum* vars. *fastigiatum* Lindb. and *Hoppei* (Hornsch.) comb. nov. (based on *P. Hoppei* Hornsch.), and *P. hyperboreum* R. Br. Morphological details are shown in the plates and text figures, and the distribution of the various species and varieties is represented by a series of 28 diagrams. [See also Bot. Absts. 13, Entry 278.]—*A. W. Evans.*

281. Möller, Hjalmar. **Lövmossornas utbredning i Sverige. VII. Hookeriaceae och Fontinalaceae. [The distribution of mosses in Sweden.]** Ark. Bot. 17[14]: 1–91. *Pl. 1–7, 35 fig.* 1922.—The 2 preceding numbers of this series have been abstracted (see 2 preceding entries). Of the 2 families treated in the present part the Hookeriaceae are represented by the single species *Pterygophyllum lucens* (L.) Brid., while the Fontinalaceae are represented by the 2 genera *Dichelyma* (with 2 species) and *Fontinalis* (with 10). The species and varieties of these genera that are recognized as Swedish are the following: *Dichelyma falcatum* (Hedw.) Myr., *D. falcatum* var. *amblystegioides* var. nov., *D. capillaceum* (Dicks.) Hartm., *Fontinalis antipyretica* L., *F. antipyretica* vars. *alpestris* Milde, *montana* H. Müll., *pseudosquamosa* Card., *livonica* (G. Roth & v. Bock) Mönkem. comb. nov. (based on *F. livonica* G. Roth & v. Bock), *robusta* Card., and *gracilis* (Lindb.) Schimp., *F. gothica* Card. & Arnell, *F. gothica* var. *dimorphophylla* var. nov., *F. sparsifolia* Limpr., *F. Kindbergii* Ren. & Card., *F. squamosa* L., *F. dalecarlica* Schimp., *F. dalecarlica* var. *microphylla* (Schimp.) Limpr., *F. seriata* Lindb., *F. dichelymoides* Lindb., *F. androgyna* R. Ruthe, *F. hypnoides* Hartm., and *F. hypnoides* var. *Adlerzii* Card. The plates give photographic representations of 17 species and varieties of *Fontinalis*, most of which were taken from the type specimens, while the text figures illustrate leaves and leaf cells of the same and a few additional forms. As in the 2 earlier numbers of the series the distribution of the various species and varieties is shown by diagrams. [See also Bot. Absts., 13, Entry 278.]—*A. W. Evans.*

282. Möller, Hjalmar. **Lövmossornas utbredning i Sverige. VIII. Timmiaceae, Weberaceae, Buxbaumiaceae och Georgiaceae. [The distribution of mosses in Sweden.]** Ark. Bot. 18[9]: 1–76. *15 fig.* 1923.—The 3 preceding numbers of this series have been abstracted (see 3 preceding entries.) The 4 families discussed in the present number are all small, the first 3 being represented by 1 genus each and the last by 2 genera. The following species and varieties occur in Sweden: *Timmia austriaca* Hedw., *T. bavarica* Hessl., *T. comata* Lindb. & Arnell, *T. norvegica* Zett., *T. megapolitana* Hedw., *Webera sessilis* (Schmid.) Lindb., *W. sessilis* var. *acutifolia* Lindb., *Buxbaumia aphylla* L., *B. viridis* (Moug.) Brid., *Georgia pellucida* (L.) Rabenh., *Tetradontium Brownianum* (Dicks.) Schwaegr., and *T. Brownianum* var. *repandum* (Funck) Limpr. The text figures illustrate the leaves and leaf-cells of the various species of *Timmia*, and the distribution of all the forms recognized, as in the earlier numbers, is represented diagrammatically.—*A. W. Evans.*

283. Pearson, William Henry. **Notes on a collection of hepatics from the Cameroons, West Coast of Africa.** Mem. Proc. Manchester Lit. Phil. Soc. 65: 1–6. *Pl. 1–2.* 1921.—The specimens here reported upon were taken by W. G. Travis from "logs of ebony, imported into Liverpool from the Cameroons," no more definite stations being given. Of the 5 species

in condition to be determined *Aneura Travisiana* and *Ceratolejeunea Saxbyi* are described as new, the latter having been collected also by H. H. Saxby in the Gold Coast region. The new Aneura is figured.—*A. W. Evans.*

284. Pearson, William Henry. **West Indian Hepaticae.** Jour. Bot. **60**: 217–228. 1922.—This paper is based on a collection made by Miss Eleonora Armitage in 1896. The species listed number 29 and include 26 from Dominica, 2 from Barbados, and 1 from both Dominica and Trinidad. The following 3, all based on material from Dominica, are proposed as new: *Herberta Armitagei*, *Metzgeria Armitagei*, and *Odontolejeunea Armitagei*. To the Herberta, however, is referred also a specimen from Guadeloupe, collected by Madiano, and to the Metzgeria the specimen from Trinidad. Each of the species listed is accomapnied by data regarding stations, and critical notes are appended to several of the more interesting forms.—*A. W. Evans.*

285. Potier de la Varde, R. **Musci madurenses. [Mosses of Madura.]** Rev. Bryologique **50**: 17–27. *16 fig.* 1923.—The 1st installment of this work, including the introduction, has already been abstracted (see Bot. Absts. 12, Entry 3385). In this 2nd installment 19 species are reported, 16 of which are proposed as new, under the joint authorship of Cardot and the author. All the species are accompanied by data regarding stations and collectors, and the new species, which are as follows, are figured and fully described: *Anomobryum latifolium*, *A. subnitidum*, *Atrichum aculeatum*, *Bartramia gathica*, *Bartramidula dispersa*, *Breutelia sclerodictya*, *Bryum Andrei*, *B. retusifolium*, *B. Vallei*, *Funaria excurrentinervis*, *F. sinuatolimbata*, *F. subimmarginata*, *Macromitrium lingulatum*, *Philonotis anisoclada*, *P. subrigida*, and *Pogonatum subperichaetiale*. There is likewise a new variety described under *Rhacomitrium javanicum* Dozy et Molk.—*A. W. Evans.*

286. Potier de la Varde, R. **Observations sur quelques espèces du genre Fissidens. [Observations on certain species of the genus Fissidens.]** Rev. Bryologique **50**: 27–30. 1923.—The preceding parts of this series have already been abstracted (see Bot. Absts., 12, Entry 1132, where references to the earlier parts may be found). The present part gives a full discussion of *F. Bambergeri* Schimp., which, in the author's opinion, is far more widely distributed in France than the printed records seem to indicate. In separating the species from its allies he lays especial emphasis on the frequent presence of antheridia in close proximity to the archegonia, the distinctive perigonial bracts persisting after the antheridia themselves have disappeared.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

D. S. Welch, *Assistant Editor*

(See also in this issue Entries 256, 257, 260, 324, 327, 328, 333, 354, 355, 370, 372, 374, 486, 487, 490, 491, 492)

FUNGI

287. Blumer, S. **Die Formen der Erysiphe cichoracearum DC. [The forms of Erysiphe cichoracearum.]** Centralbl. Bakt. II. Abt. **57**: 45–60. 1922.—A study is reported on the biologic races of *Erysiphe cichoracearum* based on inoculation experiments and conidial measurements. The species is found to contain a large number of biologic forms. The forms on *Centaurea montana* and *C. Scabiosa* are probably specialized on those species. The forms on *Senecio vulgaris*, *Centauria jacea*, and *Cirsium eriophorum* are confined to sections of these genera. In the genus *Hieracium* there are 2 biologic species, one confined to *Pilosella* the other to *Euhieraceae*. The forms on *Arctium*, *Sonchus*, *Prenanthes*, *Eupatorium*, and *Cirsium* attack all the species in the genera concerned about equally. The author thinks it is probable that specialization and morphological differentiation in parasitic fungi run parallel.—*Anthony Berg.*

288. Schussnig, Bruno. **Ein Beitrag zur Kenntnis der Cytologie von Tuber aestivum Vitt.** [On the cytology of Tuber aestivum.] Sitzungsber. Akad. Wiss. Wien. (Math.-Nat. Kl.) I Abt. **130:** 127–146. *1 pl., 3 fig.* 1921 [1923].—This account is based on material collected by J. Brunnthaler and left without examination after his death. The earliest stages in the formation of the fruit body were lacking and the account begins with the ascogenous hyphae. It is believed that oogonia and antheridia as such are not differentiated, but that the sexual processes are initiated with the appearance of the ascogenous hyphae in the hymenial layers which stand out by their deeper staining reaction, frequent branching, and the presence of 2 nuclei in each cell; the origin of the 2-nucleate condition was not determined. Each 2-nucleate cell is potentially ascogenous; the formation of the ascus primordium is believed to be preceded by nuclear fusion. The ascus results from crozier formation, or 2 cells in the hypha may unite to form asci; cell fusion is followed by nuclear fusion. The primary nucleus of the ascus divides to form 4 daughter nuclei. These do not develop uniformly or simultaneously into spores, but 1 or 2 often develop at the expense of the others. Two further divisions occur in the karyosome of each spore nucleus so that at maturity the spore is 4-nucleate.—Considerable emphasis is placed on the space differentiation of 2 nuclear components, as best exemplified in the young primary nucleus of the ascus; these are a central karyosome (idioplasm) and a surrounding zone, poor in stainable substance, called the "perikaryon" (kinoplasm). The primary nucleus is at this time spherical. A process of extrusion of chromatin from the karyosome into the perikaryon precedes division of the primary nucleus. During this process the chromatin collects in large granules at the periphery of the perikaryon; the nucleus loses its spherical shape and becomes amoeboid and eventually polygonal. The karyosome declines in stainability and a "centriole" becomes evident within it. The division which then occurs is thought to bring about reduction. In the subsequent divisions which produce the 4-nucleate stage in the spore a partial segregation of karyosome and perikaryon may occur; this is thought to be correlated with sex differentiation so that each spore is bisexual though its nuclei may be unisexual.—*F. Weiss.*

289. Trotter, A. **Oservazioni intorno ad alcuni Erisifacei italiani meno noti.** [Observation upon some less known Italian Erysiphaceae.] Ann. R. Scuola Super. Agric. Portici Ser. 2, **17:** 1–11. 1922.—The author makes an historical study of the literature dealing with 3 forms: *Microsphaera quercina* (Schw.) Burr., *Sphaerotheca mors-uvae* (Schw.) Berk. & Curt., *Oidium farinosum* Cooke. A bibliography is appended to each species.—*A. Bonazzi.*

290. Welles, Colin G. **Leaf spot of lettuce.** Phytopathology **13:** 289. 1923.—A new leaf spot of lettuce produced by a species of *Cercospora*, tentatively designated *Cercospora Lactucae* n. sp., is reported from the Philippine Islands.—*B. B. Higgins.*

LICHENS

291. Cengia-Sambo, M. **Note di bio-chimica sui Licheni.** [Note on the biochemistry of lichens.] Nuovo Gior. Bot. Ital. **29:** 89–105. 1923.—Heteremerous lichens develop oil instead of starch as reserve food. From the cells of the algae where the oil is elaborated it is translocated to the hyphae of the fungus thallus. In the development of the ascus it is found that the outermost layer of this organ consists of amyloid substances, the intermediate layer contains mostly glycogen, while the inner zone, where the spores are differentiated, contains normal protoplasm and oil. The oil does not enter the asci as such but in the form of glycogen, which is later changed back to oil. The composition of the 3 layers of the developing ascus is not the same in all lichens but shows a definite variation which permits of grouping the lichens into 3 more or less distinct classes.—*Ernst Artschwager.*

292. Plitt, Charles C. **A new species of Crocynia.** Bryologist **26:** 16–19. *Fig. 1–2.* 1923.—The new species is *Crocynia Moxleyi* Plitt, from southern California. The author presents considerable informal comment upon the species and gives a tabular synopsis of the essential characters of all species of the section *Eucrocynia.* It is noted that minute reddish specks on the lichens are due to the presence of a scale insect, *Crecoccus ehrhornii* Ckrl.—*E. B. Chamberlain.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 91, 203)

293. Chodat, R., et Lindenbein. **Sur les plantes les plus primitives connues.** [Concerning the most primitive plants known.] Bull. Soc. Bot. Genève 13: 12–13. 1921.—In a deposit below the Silurian of the Baltic region were fossil plants which are the type for the class of algae Protophyceae previously described [see Bot. Absts. 11, Entry 2841].—*W. H. Emig.*

294. Frentzen, K. **Über die Abgrenzung einiger tertiärer Arten der Gattung Cinnamomum.** [The variations and specific limits of certain Tertiary species of Cinnamomum. Verh. Naturw. Ver. Karlsruhe 29: 28–70. 1923.—The author discusses the specific features and relationships of the European Tertiary species of *Cinnamonum* commonly referred to *C. Rossmässleri, C. Scheuchzeri, C. lanceolatum, C. salicifolium, C. retusum, C. polymorphum, C. subrotundum, C. spectabile,* and *C. transversum.*—*E. W. Berry.*

295. Sahni, B. **On the structure of the cuticle in Glossopteris angustifolia Brongn.** Records Geol. Surv. India 54: 277–280. *Pl. 17.* 1923.—The author reports that in this species the epidermal cell walls of the upper surface are sinuous. The stomata are confined to the lower surface in areas where the epidermal cells are smaller, more or less isodiametric and less sinuous. This surface is marked with papillae or the scars of hairs. The stomata are without regular orientation and with 4–6 subsidiary cells. Structure shows that this species is distinct from *Glossopteris indica* Schimper with which it is often confused. The material came from the Raniganj stage of the lower Gondwana and is probably Permian in age.—*E. W. Berry.*

296. Seward, A. C. **The earlier records of plant life.** Quart. Jour. Geol. Soc. London 66: lxvi–civ. 1923.—The author passes in review the evidence and character of pre-Carboniferous plant life. He expresses scepticism regarding the evidence for such life in pre-Cambrian times, dismisses briefly the forms of the older Paleozoic, and devotes some detail to the plants that have been recorded from the Devonian.—*E. W. Berry.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash, *Assistant Editor*

Harry Braun, *Assistant Editor*

(See also in this issue Entries 18, 28, 32, 37, 39, 41, 42, 45, 48, 52, 76, 97, 99, 106, 113, 118, 142, 145, 156, 163, 168, 171, 199, 217, 226, 227, 234, 255, 256, 258, 260, 272, 287, 289, 290, 384, 387, 390, 434, 436, 446, 448, 476, 486, 489, 490, 491, 492, 502, 504, 505, 506, 507, 508, 509, 511, 519, 542, 551, 620, 621, 623)

DISEASES CAUSED BY FUNGI

297. Anonymous. **Die Krebswiderstandsfähigkeit der Kartoffelsorten Deutschlands.** [The wart resistance of German potato varieties.] Oesterreich. Zeitschr. Kartoffelbau 2: 32. 1923.—This is a transcript of the 4th revised list of the reactions of German potato varieties to wart issued by the Biologische Reichanstalt in Berlin-Dahlem, and includes the results of tests made in 1922.—*F. Weiss.*

298. Anonymous. **Die Verbreitung des Kartoffelkrebses in Deutschland.** [The distribution of potato wart in Germany.] Oesterreich. Zeitschr. Kartoffelbau 2: 40. 1923.—This names the localities in Germany where potato wart has been found up to 1922, and is based on a map issued by the German plant protection service.—*F. Weiss.*

299. Anonymous. **Investigator finds pine disease general in Europe.** Southern Lumber Jour. 49^4: 39. 1923.—This is a brief discussion of the white pine blister rust situation in Europe as reported by Perley Spaulding, U. S. Dept. of Agriculture.—*Frederick V. Rand.*

300. Anderson, H. W. **Blister canker in Illinois.** Better Fruit 17^7: 11, 24. *1 fig.*; 17^8: 10, 20. *1 fig.* 1923.—This is a summary of a recent bulletin of the Illinois Agric. Exp. Sta.—*A. E. Murneek.*

301. Baxter, D. V. **White pine blister rust in Michigan.** Phytopathology 13: 285–286. 1923.

302. Bishop, R. O., and V. R. Greenstreet. **Dichlorhydroquinone as a preventive of spot disease on rubber.** Malayan Agric. Jour. 11: 129–131. 1923.—Mold formation on crepe rubber can be prevented by mixing this substance with the latex at the rate of 35 cc. of a 4 per cent solution to 1 gallon of latex (containing 15 per cent of rubber). The properties of the rubber produced do not appear to be adversely affected.—*R. E. Holttum.*

303. Campanile, G. **Ulteriori osservazioni sulla malattia delle frutta di mandarino dovuta a Cytosporina citriperda Camp. [Further studies on the disease of mandarin fruit due to Cytosporina citriperda.]** Staz. Sper. Agrar. Ital. 55: 497–502. *2 fig.* 1922.—The paper reports a macroscopical and microscopical study of the affected fruit and its deterioration with time.—*A. Bonazzi.*

304. Cook, Mel. T. **A disease of dahlias.** Phytopathology 13: 285. 1923.—This disease is due to *Sclerotinia libertiana.*—*B. B. Higgins.*

305. Cook, Mel. T. **Blister rust of the white pine.** Phytopathology 13: 283. 1923.—The results of a single test indicate that *Cronartium ribicola* may overwinter on the black currant, *Ribes nigrum* L.—*B. B. Higgins.*

306. Cook, Mel. T. **Dwarf asparagus.** Phytopathology 13: 284. 1923.—A dwarfing of asparagus shoots, accompanied by a discoloration of the stem just below the surface of the soil, is attributed to a species of *Fusarium.*—*B. B. Higgins.*

307. Cunningham, G. H. **Powdery mildew, Podosphaera leucotrica (E. & E.) Salm. Its appearance, cause, and control.** New Zealand Jour. Agric. 26: 344–351. *7 fig.* 1923.—The mildew in New Zealand causes reduction of leafage, destruction of fruit buds, weakening or killing of laterals, and russeting, cracking, and frequent deformation of the fruit. Varietal susceptibility, the appearance of diseased parts, life history of the causal organism, and control measures are discussed.—*N. J. Giddings.*

308. Cutler, N. L. **A contribution to the knowledge of tree destroying fungi of the Vancouver forestry district.** [Abstract.] Phytopathology 13: 294. 1923.—Twenty-four species listed were found to be important.—*Frederick V. Rand.*

309. Dickson, B. T., R. Summerby, and J. G. Coulson. **Control of oat smut.** [Abstract.] Phytopathology 13: 291–292. 1923.

310. Dorst, J. C. **Aantasting van de aardappelplant door Rhizoctonia solani en haar bestrijding door sublimaat. [Rhizoctonia solani on potato and its control with sublimate.]** Tijdschr. Plantenz. 29: 97–106. 1923.—The symptoms of the disease in its various stages are described. The effect of the disease on the yield, varietal susceptibility, effect of soil and manuring, and the mercuric chlorid treatment, in which 1 per cent solution is used, are also discussed.—*D. Atanasoff.*

311. Dreger, A. **Praktische Erfahrungen eines Züchters mit der Bekämpfung von Pflanzenkrankheiten. [Practical experience of a plant breeder in the control of plant diseases.]** Wiener Landw. Zeitg. 73: 102–104. 1923.—This deals with the control of cereal smuts and leaf-stripe disease by various methods, and of brown rust of rye and yellow rust of wheat by breeding and selection. The following recommendations are given.: (1) for loose smut of barley the seed should be given a preliminary soaking in water at ordinary temperature for 8 hours followed by treatment at 52°C. for 10 minutes; (2) loose smut of wheat requires different treatment according to the variety and locality, but the preceding recommendation may be followed or a slightly higher temperature employed; (3) oat smut can be controlled by hot water treatment at 45°C. for 10 minutes, then 56°C. for 10 minutes; (4) stripe disease of barley (*Helminthosporium gramineum*) and snow mold of rye (*Fusarium nivale*) were most successfully controlled by soaking the seed for 1 hour in Uspulun, 375 gm. to 1000 l. of water, (5) stone smut of wheat (*Tilletia tritici*) was not consistently controlled by any treatment but the use of formaldehyde dip, using 500 gm. of 40 per cent formaldehyde to 1000 l. of water for 15 minutes gave the best results. No accomplishments in the breeding of rust-resistant wheat and rye are given, but the methods and possibilities of such work are discussed.—*F. Weiss.*

312. Fraser, W. P., and P. M. Simmonds. **Dusting with copper carbonate and other substances for smut control.** [Abstract.] Phytopathology 13: 293–294. 1923.

313. Gilchrist, Grace. **Bark canker disease of apple tree caused by Myxosporium corticolum Edgerton.** Jour. Bath and Western and Southern Counties Soc. **17**: 155–159. 1923.—This is a report of the 1st discovery of the disease in England in an orchard at Long Ashton in 1920, and of its subsequent discovery in a nursery at Sandford, Somerset, in which infection had occurred through grafting wounds. [See also Bot. Absts. 12, Entry 5825.]—*Joseph S. Caldwell.*

314. Harter, L. L., and J. L. Weimer. **The relation of the enzym pectinase to infection of sweet potatoes by Rhizopus.** Amer. Jour. Bot. **10**: 245–258. 1923.—*Rhizopus nigricans* is the cause of a soft rot of sweet potatoes, but it is difficult to obtain infection artificially either by placing spores or mycelium upon the unbroken surface or upon a wound. However, if the fungus is grown for 1–2 days in a sweet-potato decoction and then poured into a fresh "well" made in the potato, infection ensues. This suggests that an enzym, presumably pectinase, secreted by the hyphae, macerates the tissue in advance and thus renders it favorable for infection. This "action in advance" was proved by several means. However, the cellulose-dissolving enzym, cytase, is not produced by the 2 species of *Rhizopus* studied. No infection can take place through uninjured skin. A 48-hour-old culture of *R. nigricans* in sweet-potato decoction will often produce infection through dead rootlets or wounds. Any dead region, such as a dead rootlet, bruised region or burned surface, where the fungus can begin to grow saprophytically will give it a "saprophytic start," thus enabling it to secrete pectinase. Only after such a start can it readily attack living tissue. Wounds made by rough handling should therefore be avoided as much as possible.—*E. W. Sinnott.*

315. Hemmi, Takewo. **On the relation of temperature to the damping-off of garden-cress seedlings by Pythium De Baryanum and Corticium vagum.** Phytopathology **13**: 273–282. *2 fig.* 1923.—*Lepidium sativum* L. seed were planted in soil in series of 6 pots each, and held at various temperatures between 10 and 37°C. In 2 pots of each series the soil was inoculated with *Phythium De Baryanum* Hesse, in 2 with *Corticium vagum* B. & C. var. *Solani* Burt, and in the other 2 the soil was sterilized. At temperatures above 30°C. the cress seed germinated poorly or not at all so that no data could be obtained in regard to the effect of the higher temperatures upon the parasitism of the fungi. Both fungi produced infections at the lowest temperatures tested and at the highest temperatures at which the cress seed germinated. Infection with *Pythium* was most severe between 20 and 30°C.; with *Corticium*, between 16 and 24°C.—*B. B. Higgins.*

316. Hockey, J. F. **Blue stem of black raspberry.** [Abstract.] Phytopathology **13**: 293. 1923.

317. Holbert, James R., W. L. Burlison, H. Howard Biggar, Benjamin Koehler, George H. Dungan, and Merle T. Jenkins. **Early vigor of maize plants and yield of grain as influenced by the corn root, stalk and ear rot diseases.** Jour. Agric. Res. **23**: 583–630. *8 pl.* (*1 col.*), *20 fig.* 1923.—Both healthy and diseased maize seedlings (*Zea mays indentata*) were transplanted from germinator to field and over 150,000 plants were classified in early growth stages as to vigor. The fungi involved were *Gibberella Saubinetii*, *Fusarium* spp., and *Diplodia Zeae.* The first-named organism was used in artificial inoculations and was present in the experiments with "infested" soil. During the first 25 days, healthy seedlings made much more rapid increase in height and circumference than diseased ones and finally gave a much higher yield of larger and earlier ears. Early height and ultimate yield are directly correlated. The plants that were weak in early stages of growth either from natural infection or from artificial inoculation usually were barren or bore ears of poor quality and about ⅓ the usual size. Plants grown from disease-free seed but taken from diseased mother plants lack early vigor and produce poor yields; this is particularly true of plants grown in infested soil. Nearly disease-free seed (best commercial seed) was compared with moderately diseased seed. A consistent difference, from seedling to mature ears as noted above, was found.—Corn earworm (*Chloridea obsoleta*) of itself does not injure ears on diseased plants more than on healthy ones but ear rots which follow make the injury seem worse.—Some types of maize are so susceptible to disease that even though ears may be found free from infection the plants from them prove very susceptible when grown in infested soil.—"The importance of the disease factor demands that it be given a prominent place in any program which aims at the permanent improvement of the corn crop."—*D. Reddick.*

318. Howitt, J. E. **Two diseases new to Ontario.** [Abstract.] Phytopathology 13: 291. 1923.—Pink rot of onions [*Fusarium malli*], and white rot of grapes [*Coniothyrium diplodiella*] are briefly discussed. [See also Bot. Absts. 12, Entry 3428.]—*Frederick V. Rand.*

319. Howitt, J. E., and R. E. Stone. **Abstract of five years co-operative experiments in the prevention of oat smut.** [Abstract.] Phytopathology 13: 292. 1923.

320. Humphrey, C. J. **The destruction by the fungus "Poria incrassata" of coniferous timber in storage and when used in the construction of buildings.** Southern Lumber Jour. 49[3]: 36–37, 49–53, 55. *15 fig.* 1923.—The decay of foundations and of stored timber in lumber sheds is causing increasingly heavy losses. Much of this rot is due to *Poria incrassata* which is rapidly spreading, mainly throughout the Southern and Pacific Coast States. This rot is more or less epidemic in character and is apparently introduced into new buildings in certain cases by the use of infected lumber. Dealers can prevent its spread by close inspection and by keeping the premises free from infection.—The fungus is described and figured. It rots nearly all kinds of wood as shown by tabulated results of numerous laboratory tests.—Twelve outbreaks which have come to the author's attention, and the occurrence of this pest in buildings are discussed. The facts indicate that this fungus is a particularly destructive and rapidly growing organism which attacks practically all species of wood.—Suggestions for inspection, control, and eradication are given.—*Frederick V. Rand.*

321. McCallum, A. W. **The present status of white pine blister rust in Canada.** [Abstract]. Phytopathology 13: 291. 1923.

322. Mahner, A. **Feldversuche mit Beizmitteln zur Bekämpfung des Haferbrandes.** [Experiments with seed dips to control oat smut.] Wiener Landw. Zeitg. 73: 50–51. 1923.—A test of a number of proprietary seed dips in comparison with the standard formaldehyde and bluestone treatments showed that only "Germisan" was as effective a fungicide and could be recommended for its convenience and freedom from injury to the seed.—*F. Weiss.*

323. Major, T. G. **Cultural reactions of some dry-rot organisms.** [Abstract.] Phytopathology 13: 291. 1923.—Seven species of *Fusarium* were studied.—*B. B. Higgins.*

324. Manns, Thomas F. and J. F. Adams. **Parasitic fungi internal of seed corn.** Jour. Agric. Res. 23: 495–524. *Pl. 1–13.* 1923.—The seed of maize [*Zea Mays*] in Delaware and in 21 other maize-growing states is commonly infected with 4 parasitic fungi, and occasionally with a variety of others. The 4 important ones with their prevalence in farm-selected, Delaware-grown seed [crop of 1920?] are: *Cephalosporium Sacchari*, 40 per cent; *Gibberella Saubinetii*, 6 per cent; *Fusarium moniliforme*, 20 per cent; *Diplodia Zeae*, 6 per cent. Two or more of the organisms may occur in the same seed. The prevalence of these parasities in other states is indicated in tabular form.—Internal infection may occur without external manifestation. The organisms are found abundantly in the cavity lying between the cap of the kernel and the dorsal extremity of the scutellum. If the fungus has progressed to the embryo a characteristic discoloration is found, black for *Diplodia*, lavender for *Fusarium* and pink for *Gibberella*.—"No conclusive evidence was secured which indicates the manner in which infection becomes established in the seed." A bibliography of 40 titles is appended.—*D. Reddick.*

325. Waterhouse, Walter L. **Some aspects of the wheat rust problem.** Agric. Gaz. New South Wales 34: 381–387. 1923.—Yellow stripe rust (*Puccinia glumarum*) is not known to occur in Australia. Leaf rust (*P. triticina*) occurs but is not believed to do much damage. It is probable that this rust is not specialized into biologic forms in Australia and the breeding of desirable resistant wheats should be a simple matter. Stem rust (*P. graminis*) does the major damage in Australia, the loss in New South Wales alone in 1916 amounting to $10,000,000. It is not usually observed until the beginning of summer. A popular exposition is given of our present knowledge concerning resistance, specialization and biologic forms of stem rust. Biologic forms have been found in Australia corresponding to those in the U. S. A.—*L. R. Waldron.*

326. Weir, James R. **Polyporus Spraguei Berk., cause of heart rot.** Phytopathology 13: 288. 1923.—*Polyporus Spraguei* is reported as causing a heart rot of the roots and trunk of *Quercus rubra*, *Q. prinus*, *Q. coccinea*, *Q. velutina*, *Q. marylandica*, and *Castanea dentata*.—*B. B. Higgins.*

DISEASES CAUSED BY BACTERIA

327. Bonanni, A. **La tubercolosi o rogna dell'olivo.** [Tuberculosis of the olive.] Staz. Sper. Agrar. Ital. 56: 124–144. *7 fig.* 1923.—This is a study of the microflora of the tubercles at different seasons of the year, and the isolation of an organism presenting all the characteristics of *Bacterium Savastanoi E. F. S.* with the exception of the arrangement of the flagella. This organism is carefully described and pictured. It was constantly found in pathologic processes, often accompanied by a variable contaminating flora which Bonanni considers the source of the various organisms isolated from time to time by different authors. Inoculation experiments gave positive results with *Bact. Savastanoi*, while the other organisms isolated gave negative results. A histological study is also made of the natural and of the artificially induced tubercles, and a close similarity of the structures is noticed. *Bact. Savastanoi* was reisolated from the experimental material.—*A. Bonazzi.*

328. Manzoni, L. **Una causa batterica dell' incappucciamento del trifoglio pratense.** [A bacterial leaf curl of clover.] Staz. Sper. Agrar. Ital. 55: 136–144. *7 fig.* 1922.—The author describes a leaf curl which invaded clover (*Trifolium pratense*) fields and ruined the crop. The disease is characterized by curly leaf, small and crowded leaves, and a discoloration of the vascular system of the roots a little below the crown. From the discolored portion of the root the author on several occasions isolated on clover-root-agar a small bacterium forming white colonies 2–5 mm. in diameter, white, watery and smooth. Inoculations of the organism into the roots of healthy plants gave encouraging results. Although leaf curl did not result, discoloration and deformation by proliferation of the root vascular strands did occur, and in the xylem strands zoogloeic masses were found similar to those in the natural disease. The leaf curl is however considered by the author not essentially a part of the infective process, but only a secondary morbid modification due to disturbances of nutrition. The organism isolated is not fully described and more proofs are necessary for definite conclusions.—*A. Bonazzi.*

329. Martin, Wm. H. **Potato scab and methods for its control.** New Jersey Agric. Exp. Sta. Circ. 131. *12 p., 3 fig.* 1922.—The symptoms, and seed and soil treatments are discussed. Recommended control measures are the adoption of seed treatment, use of acid fertilizers, plowing under green manures, and, where a considerable portion of the crop is unsalable, the use of sulphur.—*Wm. H. Martin.*

330. Richardson, J. K. **Bacterial soft rot of Iris.** [Abstract.] Phytopathology 13: 293. 1923.—The rot is due to *Bacillus carotovorus* Jones.—*B. B. Higgins.*

331. Root, E. R. **Are bees carriers of fire-blight?** Better Fruit. 18[1]: 8, 26. 1923.—According to the author bees are not the chief carriers of fire-blight, and if they do carry blight to a limited extent their value in pollination offsets many times any possible damage they may do as disease carriers.—*A. E. Murneek.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

332. D'Ippolito, G. **La Siphonophora cerealis parassita delle spighe virescenti di frumento.** [Siphonophora cerealis parasitic in the virescent heads of wheat.] Staz. Sper. Agrar. Ital. 55: 407–420. *5 fig.* 1922.—The author finds the phenomenon of virescence in wheat and in *Setaria verticillata* and finds gall-like structures at the base of the glumes due to the insect. The sexual organs are the most modified, presenting all stages of vegetative reversion.—*A. Bonazzi.*

333. Dustan, A. G. **The natural control of the green apple bug (Lygus communis var. novascotiensis Knight) by a new species of Empusa.** [Abstract.] Phytopathology 13: 290. 1923.

334. Giesenhagen, K. **Entwicklungsgeschichte einer Milbengalle an Nephrolepis biserrata Schott.** [The development of a mite-gall on Nephrolepis biserrata.] Jahrb. Wiss. Bot. 58: 66–104. *Pl. 2–3, 3 fig.* 1919.—After briefly reviewing previous investigations of galls and gall-like growths caused on ferns by fungi and insects the author describes and figures in detail his present investigation of galls caused by *Eriophyes Nalepai* on *Nephrolepis biserrata.* He

concludes that the morphology of these galls is due not to any specific morphogenic incitant substance given out by the gall mite, but that it is the combined result of the wounding and of a continuous overnourishment of the wound defense tissue and of the cells of the permanent tissue in its vicinity brought about by the presence of the mite.—*Frederick V. Rand.*

335. Gurney, W. B. **Cold storage as a control of fruit fly.** Agric. Gaz. New South Wales **34:** 528. 1923.—Various fruits kept in cold storage at 34°F. and then removed for observation showed no flies developing after a period of 3 months.—*L. R. Waldron.*

336. Ritzema Bos, J. **Het Stengelaaltje (Tylenchus devastatrix Kühn).** [**The eelworm (Tylenchus devastatrix).**] Tijdschr. Plantenz. **28:** 159–180. *1 pl.* 1922.—The writer describes the biology of *Tylenchus devastatrix* and the pathologic changes which it produces on its various host plants in general and on rye in particular. A list of plants known to be attacked by this nematode is also given. Recommendations for control comprise: (1) proper soil preparation and sufficient manuring; (2) use of resistant varieties; and (3) crop rotation, in which plants that are only slightly or not at all attacked by nematodes should be used.—*D. Atanasoff.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

337. Gram, Ernst. **Forsög med Avlsstedets Indflydelse paa Kartoffelens Bladrullesyge.** [**Potato leaf-roll influenced by the origin of the tubers.**] Tidsskr. Planteavl **28:** 769–806. *4 fig.* 1922.—Potato leaf roll was discovered by Appel in Denmark in 1905. The symptoms may be confused with the rolling of the leaves due to *Bacillus phytophthorus*, or leaf rolling may occur on sandy soil when spring is favorable to sprouting. Phloem necrosis has been found constantly in stems from leaf-roll plants. Degeneration due to continual vegetative reproduction has never been verified and deterioration due to poor adjustment to extreme environment is not well segregated. Reports on the influence of light and heavy soils on leaf roll are contradictory and the influence of fertilizers has not been fully investigated. Potassium in a field experiment caused distinct rolling not due to the leaf-roll disease. A cool moist climate has a marked effect on the frequency of true leaf-roll.—An experiment was performed with 2 lots of Magnum Bonum, one healthy in 1914, the other healthy in 1911 but badly diseased in 1914. They were grown at 12 experiment stations until 1919. Each autumn samples were sent to North Seeland and the growth compared the following year to determine the local influence on leaf-roll and cropping; tables showing the results are presented. At some stations the diseased potatoes recovered, while at others the healthy tubers became highly infected. It is thought that peat and sandy soil aided recovery, but that the climatic influence is of greatest importance. Weather records indicate that in 80 per cent of cases, cool and moist weather in May and June is followed the next year by decreased infection. This may possibly be due to a decrease in aphids and other agents of dissemination. In sections where leaf-roll is common, it is helpful to use tubers from disease-free sections. Field selection is useful. Promising experiments are under way to prevent new infection by controlling aphids and developing resistant varieties. A summary in English is appended.—*Albert A. Hansen.*

338. Hockey, J. F. **The control of raspberry mosaic.** [Abstract.] Phytopathology **13:** 292. 1923.

PARASITIC ALGAE

339. Sharples, A. **Report on "Black Fruit" disease of pepper vines in Sarawak.** Malayan Agric. Jour. **11:** 120–128. 1923.—Pepper was formerly one of the staple crops of Sarawak, but over-production about 1906 led to the abandonment of plantations. In recent years the black fruit disease has caused rapid decline in exports. The disease is caused by the alga *Cephaleuros mycoidea* Karsten, which also causes diseases of tea, cloves, etc. On pepper its attack is almost confined to the young fruits, which turn black, shrivel, and usually fall. It is considered that by careful organization, especially in regard to prevention of abandonment of plantations which may afterwards become centers of infection, the disease could be controlled and reduced to negligible proportions.—*R. E. Holttum.*

PARASITIC PHANEROGAMS

340. Heinricher, E. **Das Absorptionssystem von Arceuthobium Oxycedri (D.C.) M. Bieb. [The absorption system in Arceuthobium Oxycedri.]** Ber. Deutsch. Bot. Ges. **39**: (20)–(25). 1921/1922.—The absorbing system of the dwarf mistletoe, *Arceuthobium Oxycedri*, is thalloid in nature and in its development comparable to the mycelia of fungi. The major part of the haustorial branches contain a large amount of chlorophyll which seems to indicate that at least during its early life the parasite takes from its host water and mineral substances primarily. The penetration power and the efficiency of the absorbing system of this parasite are superior to those of other Loranthaceae. The host tissue becomes traversed by numerous haustorial branches and its elements, especially the rays, become greatly distorted and disarranged. The annual rings of the infected region have a greater diameter, and the elements, notably the tracheids, are larger and less intensely lignified.—*Ernst Artschwager.*

NON-PARASITIC DISEASES

341. Anonymous. **Current topics.** Nature **111**: 679. 1923.—The director of the Botanic Gardens at Kew has called the attention of the House of Commons to the damage likely to result from smoke. "There can be no doubt that heavy deposits of soot such as are borne by the evergreens at Kew are clear indication of atmospheric contamination which will markedly lower the vitality of the plants in the Gardens and in some cases may actually prevent their successful cultivation." At present the greatest damage probably arises from reduction of light.—*O. A. Stevens.*

342. Birmingham, W. A. **"Sour-sap" of fruit trees. Some records of its occurrence, and experiments for its control.** Agric. Gaz. New South Wales **34**: 431–437. *4 fig.* 1923.—From 1918 to 1920 a disease appeared attacking peach, plum, apricot, and apple trees to which the name "sour-sap" was given. The trees died down to the point of insertion of the stock, a peculiar sour smell came from the affected wood, and no apparent fungus or insect pest could be found. In 1920 experiments were outlined to determine whether effective treatments were possible; and studies were made to determine the cause or causes of the disease. Apparently the same disease appears in the U. S. A. and is known there as "winter kill" or "spring injury." The disease does not appear to be due to an organism but is probably the result of a physiological disturbance. Various fertilizer soil treatments were not of benefit. Certain varieties show resistance.—*L. R. Waldron.*

343. Köck, Gustav. **Fälle von Schwarzherzigkeit (Black heart) bei den englischen Saatkartoffeln. [Occurrence of black heart in English seed potatoes.]** Oesterreich. Zeitschr. Kartoffelbau **2**: 36. 1923.—This disease is reported to have occurred frequently in the variety Up-to-Date imported from Ireland.—*F. Weiss.*

344. Riede, W. **Ein einwandfreier Rauchschadennachweis. [A certain evidence of smoke injury.]** Mitteil. Deutsch. Landw. Ges. **38**: 423–424. 1923.—The difficulty of proving injury from industrial gases is pointed out and it is stated that the only certain evidence of injury is to be secured by planting test gardens around the smoke area. Pot culture tests are also recommended.—*A. J. Pieters.*

345. Summers, F. **The physiology of leaf scorch.** (Report of National Fruit and Cider Institute.) Jour. Bath and Western and Southern Counties Soc. **17**: 123–132. 1923.—The paper reviews various theories as to causation of leaf scorch or tip burn, and reports preliminary conclusions from experimental studies at Long Ashton. Potash starvation depresses photosynthetic activity and may be the primary factor in producing tip burn, with phosphoric acid deficiency playing a definite but subsidiary rôle. Scorching also occurs when the leaf water is so rapidly withdrawn that the transpiration stream becomes discontinuous. The relation of potash deficiency in the soil to the water relations in the transpiring shoot needs further study.—*Joseph S. Caldwell.*

346. Wallace, T. **Experiments on chlorosis with special reference to cases at Winscombe, Somerset.** Jour. Bath and Western and Southern Counties Soc. **17**: 159–167. 1923.—Two soils which are high in calcium and magnesium content were used in pot experiments with tomato. Chlorosis developed in one soil which was high in carbonates, but did not develop

in the other which was low in carbonates. Both soils were practically neutral in reaction. Additions of the carbonates to the good soil resulted in the appearance of chlorosis in plants grown therein. Plants grown in autumn did not develop the trouble to the same degree as those grown in summer. Spraying with 0.1–1.0 per cent solutions of ferrous sulphate in all cases caused very serious injury to the foliage of tomatoes without apparent benefit to the chlorotic condition. Mustard plants did not develop chlorosis under any of the conditions employed.—*Joseph S. Caldwell.*

DISEASES OF UNKNOWN CAUSE

347. Savastano, Luigi. **Contributo allo studio del male dello scopaccio negli agrumi.** [**Contribution to the study of witches-broom in citrus trees.**] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **6**: 119–124. *Pl. 6–11.* 1922.—A description is given of a rare affection of citrus trees which results in the development of hypertrophied branchlets on atrophied twigs. Tubercle development precedes this deformation. The disease is studied only from a cultural standpoint, and this paper is a descriptive contribution that adds little to our knowledge of the causes. The fruit also is affected. Thorough and early pruning is recommended. [See also following Entry.]—*A. Bonazzi.*

348. Savastano, Luigi. **Il male dello scopaccio negli agrumi.** [**Witches-broom in citrus trees.**] R. Staz. Sper. Agrumic. e Fruttic. Acireale Bull. 45. *3 p., 1 fig.* 1922.—[See also preceding Entry.]—*A. Bonazzi.*

349. Stone, R. E. **Root rot and blight of canning peas.** [Abstract.] Phytopathology **13**: 293. 1923.

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

350. Anonymous. **Neue Beizmittel: Chlorol, Tillantin B.** [**New seed dips, Chlorol and Tillantin B.**] Wiener Landw. Zeitg. **73**: 86. 1923.—Favorable results are reported from the use of these new proprietary compounds as seed dips for the prevention of grain smuts. Tillantin B is a colloidal, arsenic-containing copper compound.—*F. Weiss.*

351. Anonymous. [Rev. of: Holbrung, M. **Die Mittel zur Bekämpfung der Pflanzenkrankheiten.** (**Measures for control of plant disease.**) *3rd rev. ed., 8 vo, xii + 406 p., 58 fig.* P. Parey: Berlin, 1923.] Wiener Landw. Zeitg. **73**: 235. 1923.

352. Anonymous. [Rev. of: Roebuck, A. **Insect pests and fungous diseases of farm crops.** *55 p.* (Successful Farming Series.) Benn Bros.: London, 1923.] Nature **111**: 804. 1923.

353. Appel, Otto. **Beispiele zur mikroskopischen Untersuchung von Pflanzenkrankheiten.** [**Examples for microscopical study of plant diseases.**] *3rd ed., 54 p., 63 fig.* Julius Springer: Berlin, 1922.—Numerous inquiries from agriculturists, agricultural schools, and young botanists who wished to obtain a general view of the subject of plant pathology showed the need of a small book of this type, and led to the final publication of this work which now appears in its 3rd enlarged and improved edition.—Part 1 deals with the following diseases: bacterial rots of potato, bacterial blight of cherry, clubroot of crucifers, potato wart, white rust of crucifers, Phytophthora disease of potatoes, downy mildew of the vine, plum pockets, leaf-spot diseases of clovers, Rhytisma leaf disease of maple, powdery mildew of grain and grasses, powdery mildew of the vine, Dematophora disease of the vine, ergot, smuts of corn and the small grains, grain rusts, rust of pear trees, bean anthracnose, brown rot of stone fruits, apple and pear scab, black mold of grains, and wilt diseases of legumes.—In a similar manner Part 2 takes up the more important animal parasites, including nematodes, mites, aphids, San Jose scale, insect galls, etc.—*Frederick V. Rand.*

354. Ciferri, R. **La "carie" del pomodoro.** [**Tomato rot.**] Staz. Sper. Agrar. Ital. **55**: 145–162. 1922.—This is a study of a new tomato disease presenting 2 distinct types of symptomatology, namely, a moist and a dry rot phase. From the fruit with the dry rot the author isolated *Phoma Ferrarisii n. sp.*, and *Ramularia Ferrarisii n. sp.*, both of which he describes. Indications were obtained in support of the hypothesis that the Ramularia is the conidial form of the Phoma, but on this point the author does not insist. In the moist type *B. mesentericus*

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was isolated. Inoculations on sterilized fruit with the Phoma and with subsequent sealing of the wounds with paraffine led to the dry rot. Inoculations with *B. mesentericus* alone gave no evidence of disease, while inoculations with the 2 forms together led to the moist type of rot. The study is divided into several portions among which those relating to the conditions necessary for the development of the moist and dry rot, the relationships of the fungus and bacterium and the relative part taken by each organism in the disease are very suggestive. A typical case of symbiosis in parasitism is here brought out. The disease was not found to be very widespread.—*A. Bonazzi.*

355. Clarke, J. Jackson. **Protists and disease.** *xl + 229 p., frontispiece + 61 fig.* Baillière, Tindall and Cox: London, 1922.—"Denial of the existence of non-nucleated phases of some protists renders complete comprehension of many diseases impossible. In the following pages I show once again how the plasson [non-nucleated] state plays a leading part in the lives of the parasites which cause molluscum contagiosum, cancer, smallpox, etc. * * * If unprejudiced and willing examination of molluscum bodies is made in the simple way described in this book, it will be recognized in the course of a few days that these bodies are parasitic organisms. In molluscum we have an easy key to smallpox, the filterable organisms, and to cancer. * * * Another aim has been to establish the biological relationships of the pathogenic organisms dealt with; * * * "—In the 11 chapters following the preface, from which the above quotation is taken, the author discusses the fundamentals of protistology, some algal and fungal protists, Chytridiineae, the Synchytrian nucleus, "cancer-bodies" in Synchytrium and in syphilis, Plassomyxineae and molluscum contagiosum, Plasmodiophoraceae, Mycetozoa, Acrasieae, affinities and phylogeny of Mycetozoa, chromidia and nuclei of *Arcella vulgaris*, and notes on smallpox, syphilis, cancer, etc.—Many plant as well as human and animal parasites are discussed with special reference to life histories, reproduction, and phylogenetic relationships.—One of the sweeping general statements made is that "the foundation of all biology and pathology, the cell-theory, as it exists today, is unsound in that it is contradictory of akaryote states which are dominant in the lives of certain protists."—*Frederick V. Rand.*

356. Claus, Eugen, Gustav Köck, und Erwin Janchen. **Neuere Erfahrungen über den Einfluss von Uspulun und Uspulunbolus auf die Kartoffelerträge. [Recent experiments on the effect of Uspulun and Uspulunbolus on the yield of potatoes.]** Oesterreich Zeitschr. Kartoffelbau **2**: 29–30. 1923.—This is a report of 4 tests carried out to determine the preservative action of these materials on stored potatoes as well as their effect on germination and yield. The results are not wholly in agreement and are still inconclusive, but point to a beneficial effect of both materials, when storage rots are a factor, on the keeping quality and germinative vigor of seed potatoes, and in wet seasons upon the yield. In 1 experiment the increase in yield amounted to 45 per cent. In dry seasons either no effect or a slight decrease in yield has been observed.—*F. Weiss.*

357. Coulson, J. G. **Peony diseases.** [Abstract.] Phytopathology **13**: 292–293. 1923.

358. Dickson, B. T. **Plant diseases of 1922 in western Quebec.** [Abstract.] Phytopathology **13**: 290. 1923.

359. Farley, Arthur J. **Dry-mix sulfur lime. A substitute for self-boiled lime sulfur and summer-strength concentrated lime-sulfur.** New Jersey Agric. Exp. Sta. Bull. 379. *16 p., 2 fig.* 1923.—Various sulphur fungicides are discussed and compared with dry-mix sulphur lime which is prepared with 8 pounds of sulphur, 4 pounds of hydrated lime, and 8 ounces of calcium caseinate in 50 gallons of water. In a spray test with peaches a comparison was made of various sulphur fungicides to determine their efficiency in the control of scab. On trees sprayed with the dry-mix sulphur lime 8.4 per cent of the crop was scabbed; with self-boiled lime sulphur, 9.7 per cent; with atomic sulphur, 42.8 per cent; with 80–20 dust, 4.1 per cent; and on unsprayed trees, 49.5 per cent. When the amount of sulphur in the dry-mix was decreased to 2 pounds the number of scabby fruit increased to 29.8 per cent. In a similar test, with apples, no diseases appeared on the untreated trees. The fruit on trees sprayed with the dry-mix sulphur lime, however, showed considerably less russeting than that from trees sprayed with concentrated lime sulphur and slightly less than that from trees sprayed with atomic or self-boiled lime-sulphur.—*Wm. H. Martin.*

360. Grafe, V. **Neue Principien des Pflanzenschutzes.** [New principles in plant protection.] Wiener Landw. Zeitg. 73: 233. 1923.—This is a general statement regarding the preparation of metals such as mercury and silver, and of non-metals such as sulphur in the colloidal state (hydrosols), and of their use as fungicides. The use of formaldehyde (0.1 per cent solution) applied as a spray on the green parts of plants, to which it is not toxic, also is suggested. —*F. Weiss.*

361. Headlee, Thomas J., William H. Martin, and Arthur J. Farley. **Spray calendar for apples and quinces.** New Jersey Agric. Exp. Sta. Circ. 147. *4 p.* 1923.—This supersedes Circular 132 of the New Jersey Agricultural Experiment Station.—*Wm. H. Martin.*

362. Headlee, Thomas J., William H. Martin, and Arthur J. Farley. **Spray calendar for grapes.** New Jersey Agric. Exp. Sta. Circ. 151. *3 p., 1 fig.* 1923.

363. Headlee, Thomas J., William H. Martin, and Arthur J. Farley. **Spray calendar for peaches.** New Jersey Agric. Exp. Sta. Circ. 148. *4 p., 3 fig.* 1923.—This supersedes Circular 133 of the New Jersey Agricultural Experiment Station.—*Wm. H. Martin.*

364. Headlee, Thomas J., William H. Martin, and Arthur J. Farley. **Spray calendar for pears.** New Jersey Agric. Exp. Sta. Circ. 149. *4 p., 3 fig.* 1923.—This supersedes Circular 134 of the New Jersey Agricultural Experiment Station.—*Wm. H. Martin.*

365. Headlee, Thomas J., William H. Martin, and Arthur J. Farley. **Spray calendar for plums and cherries.** New Jersey Agric. Exp. Sta. Circ. 150. *4 p., 1 fig.* 1923.—This supersedes Circulars 119 and 135 of the New Jersey Agricultural Experiment Station.—*Wm. H. Martin.*

366. Humphrey, C. J. **Decay of mine timber.** Proc. Amer. Wood-Preservers' Assoc. 18: 213–224. *3 fig.* 1922.—Up to 1905 the study of fungi on mine timbers was mycological rather than pathological.—The kinds and grades of timber ordinarily used in mines are discussed. Such timber in mines is destroyed by breakage, decay, fire, insects, and wear,—breakage and decay being the more important factors. Suitable moisture, favorable temperature, and the presence of wood which can be readily attacked are the principal conditions accelerating the action of wood-destroying fungi in timber. These conditions may vary in different mines, in different parts of the same mine, and at different seasons of the year. The most rapid decay occurs under medium conditions of temperature and moisture.—A discussion of control measures includes changes in the ventilating systems, use of cement, iron, etc., in place of wood, and various methods of wood-preservation.—*Frederick V. Rand.*

367. Lek, H. A. A. v. d. **Afscheiding van giftstoffen door zwammen, welke ziekten der houtvaten veroorzaken.** [Toxin secretion by fungi that invade the vascular bundles.] Tijdschr. Plantenz. 28: 183–186. 1922.—A brief review is given of the literature and of the writer's former studies regarding the way in which the vascular-bundle parasites like *Fusarium* and *Verticillium*, and also some bacteria, cause wilting of the infected plants. The wilting is not the result of clogging up of the vascular bundles but very likely due to the secretion of poisons which bring about the dying of leaf parenchyema and wilting of the leaves, as Klebahn claims. *D. Atanasoff.*

368. Martin, Wm. H. **Potato diseases in New Jersey and their control.** New Jersey Agric. Exp. Sta. Circ. 146. *32 p., 24 fig.* 1923.—This is a popular description of the diseases of potatoes in New Jersey and measures for their control.—*Wm. H. Martin.*

369. Oortwijn Botjes, J. **Onbekende factors bij het kweeken van ziektevrij pootgoed.** [Unknown factors in the production of disease-free seed potatoes.] Tijdschr. Plantenz. 29: 113–126. 1923.—The age of the potato varieties does not effect their yield, but all potato varieties are subject to degeneration the symptoms of which are now known as symptoms of leafroll, mosaic, crinkle, and other infectious diseases. Were it possible to keep the existing varieties in their original condition the further breeding of new varieties could be discontinued. Though it is possible by means of selection to keep a variety in its original condition if only there is to be found at least one tuber free from any of the degeneration diseases, there are, however, indications that the value of the selection is limited and that some varieties cannot be cultivated continuously in certain localities. As new factors in connection with disease-free seed potato production the author discusses the following: (1) some varieties in the course of time seem to become more susceptible to degeneration and other diseases; (2) besides plants from diseased tubers and other Solanaceous plants, there are indications that plants belonging to

widely different families may also harbor and transmit such diseases; (3) the disease-transmitting insects appear and are most numerous during the latter portion of the growing season when most new infections take place, and besides this the primary infection advances downwards toward the tubers quite slowly, as is shown by the fact that not all of the tubers of infected plants give diseased progeny. In these facts the author sees a possibility of producing disease-free potatoes. This can be accomplished by digging the potatoes earlier, at a time before the majority of the new infections take place, and before infection from the already infected aerial portions has reached the tubers.—*D. Atanasoff.*

370. Petch, T[homas]. **The diseases of the tea bush.** *xii + 220 p., 3 pl. (col.), 69 fig.* Macmillan and Co.: London, 1923.—This comprehensive work on tea diseases was written in order that the planter might recognize the diseases which have been recorded and take steps to control them or to lessen the probability of their occurrence.—After a preliminary chapter on fungi in general, some 60 diseases of tea are discussed under the following headings: (1) leaf diseases, (2) leaf and stem diseases, (3) stem diseases, and (4) root diseases. The final chapters deal with wound covers, sprays and sprayers, mycological notes, and descriptions of fungi found on the tea bush. A bibliography is included.—*Frederick V. Rand.*

371. Pichler, Friedr., und Arthur Wöber. **Bestrahlungsversuche mit ultraviolettem Licht, Röntgenstrahlen und Radium zur Bekämpfung von Pflanzenkrankheiten.** [**Experiments with ultra-violet light, Röntgen rays and radium for the control of plant diseases.**] Centralbl. Bakt. II Abt. 57: 319–327. 1922.—Spores of various grain smuts were subjected to the rays of ultra-violet light, radium, and X rays. Favorable results were obtained with the ultra-violet light and Röntgen rays. Radium proved to be of no value. The best results were obtained when the seeds were immersed in an acid solution, especially in the presence of oxygen or an oxidizing substance. The Röntgen rays, because of their penetrating ability, proved to be superior to the ultra-violet light.—*Anthony Berg.*

372. Poeteren, N. van. **Verslag over de werkzaamheden van den Plantenziektenkundigen Dienst in de jaren 1920 en 1921.** [**Annual report of the Phytopathologic Service for 1920 and 1921.**] Verslag. en Mededeel. Plantenziektenkundigen Dienst Wageningen 27. *92 p., 2 pl.* 1922.—From this detailed report discussing at length the various activities of the Dutch Phytopathological Service only chapter 9, "Investigations and Experiments" will be considered here.—A peculiar disease of unknown origin was observed in the spring of 1920 on currants, the buds of the plants failing to develop and the plants remaining barren. No discoloration of the woody portions or of any other part of the plants is apparent. The leaf margins of plants thus affected the preceding year first turned yellow, then black and soon the whole leaf shrivelled and died. Isolations from diseased plants yielded cultures of *Coniothyrium*, *Pestalozzia*, *Botrytis*, and *Fusarium* spp. Infection work is in progress.—A new disease of gooseberries causing a dying off of the tops and apparently caused by *Phytophthora* is described. Alkaline Burgundy mixture (1½ kgm. copper sulphate and 1½ kgm. soda per 100 l. water), was most effective for controlling the American gooseberry mildew.—The symptoms and ecology of a nematode disease of strawberries are discussed. The nematodes are found only on the leaves and flowers.—As a control measure against *Ascochyta citrullina* canker of tomato the destruction of the infected plants is recommended.—A Verticillium wilt disease of lilac is briefly described.—Premature tuber formation of potatoes is attributed to the warm storage of the seed potatoes.—The perithecia of *Pleospora trichostoma*, the perfect form of *Helminthosporium gramineum*, cause of the stripe disease of barley, are always borne on the seed remains of the young seedlings. If infected barley kernels are kept for 3 days in a moist and warm chamber the perithecia appear on them also, thus making it possible to test the seed for stripe disease. Copper sulphate 8 per cent, 3 l. per hectoliter of barley; Germisan 4 per cent, 3 l. per hectoliter of barley; Germisan 3 per cent, 4 l. per hectoliter of barley; Uspulun at least 1 per cent, 7 l. per hectoliter of barley gave best results in treating the seed against stripe disease.—Disinfection of the grain in a 0.5 per cent Uspulun solution for 1 hour completely eliminated stinking smut of wheat while the control showed 39.68 per cent of infected plants.—Dry temperature of 50°C. for 24 hours failed to kill the virus of leaf roll in infected tubers.—*D. Atanasoff.*

373. Roebuck, A. **Insect pests and fungous diseases of farm crops.** *55 p., 25 fig.* Benn Bros.: London, 1923.—This booklet gives a brief popular discussion of some of the principal

insect and fungus enemies of farm crops, with suggestions as to preventive and control measures.—*Frederick V. Rand.*

374. Stakman, E. C. **The species concept from the point of view of a plant pathologist.** Amer. Jour. Bot. **10**: 239–244. 1923.—The author points out the great practical importance to the pathologist of exact taxonomic knowledge both of host plants and of parasites. He emphasizes the significance of the pure-line concept in pathology and the necessity of absolute purity in experimental material. This is especially difficult to secure in the case of pathogenic fungi, and the ordinary published descriptions of such forms, made primarily on the basis of morphology, have been of little practical use largely because of the great structural changes which may be produced by various environmental factors. The recognition of physiological races or biologic types, through differences based on physiological reactions, is becoming more common. These races were not called species partly because the morphological concept of species had become so firmly fixed and partly because such biologic forms were believed to be unstable. The author shows that the so-called plasticity of biologic forms of *Puccinia graminis* does not exist but that these forms are as real and constant as true species. Many of them also differ morphologically as well as physiologically. He suggests a consideration of Brierley's modification of Lotsy's proposed terminology, wherein the term *linneon* replaces the species in the Linnaen sense—the description being based on morphological grounds; *jordanon* would be based on morphological characters which were demonstrated to be transmissable; and *species* would be established only on the basis of morphologic and physiologic reaction under standardized conditions.—*E. W. Sinnott.*

375. Weiss, C. O. **Diseases and pests of raspberries.** Better Fruit 17^6: 7–8; 17^7: 10, 20. 1923.—Symptoms, injury, and control of the following more important diseases in the Pacific Northwest are briefly discussed: crown gall, mushroom rot on berries (*Armillaria mellea*), root rot, anthracnose (*Plectodiscella venetum*), spur blight (*Mycosphaerella Rubina*), rust (*Phragmidium imitans*) and cane blight (*Leptosphaeria Fuckelii*). Winter injury to the raspberry is of common occurrence in this section. Bearing canes and roots are usually frost-killed in November and December, and young shoots in April and May. The various types of winter injury are listed. Any cultural practices tending to facilitate the early maturing of canes will lessen materially the damage from frost.—The cane maggot, root or crown borer and red spider are also discussed.—*A. E. Murneek.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

H. W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 47, 110, 128, 420, 421, 423)

376. Anonymous. **The active principle of Chaparro.** Pharm. Jour. **109**: 562. 1922.—Many cases of amoebic dysentery that have been resistant to emetine have yielded to treatment by chaparro amargosa or bitter bush, *Castela Nicholsoni.* In a report on 67 cases 28 were cured. A glucoside, castelin, and a bitter principle, castelamarin, have been isolated from the drug. The former crystallises in long white needles, melting at 205°C.; it dissolves in 85 parts of water at ordinary temperature, and in 25 parts of boiling water. It is soluble in ethyl alcohol, and gives a deep violet coloration with concentrated sulphuric acid. It is dextro-rotatory, and is readily hydrolyzed by dilute acids and alkalies, yielding castelagenin. The formula attributed to it is $C_{15}H_{22}O_8$.—*E. N. Gathercoal.*

377. Anonymous. **The new Japanese pharmacopoeia.** Pharm. Jour. **109**: 559–562, 584–586. 1922.—The 1st edition was issued in 1886 after compilation by a committee appointed by the Central Council of Health. The 4th edition became official in Japan in 1921.—Five years were spent in the last revision; 73 articles were added, 94 omitted, and about 1,400 alterations, besides numerous improvements on the terms and phrases in almost every article, were made. A number of drugs of Japanese origin are of especial interest because so little known in English countries and yet receiving this official recognition. Among such drugs are Katakuri Starch from the root of *Erythronium japonicum;* Kudzu Starch from the root of *Puerara hirsuta;*

Bakucki Leaves from *Prunus macrophylla;* the leaves and the root of *Scopolia japonica;* the galls on the leaves of *Rhus javanica;* the herb of *Swertia japonica;* Tsubaki Oil, the fixed oil from the husked seeds of *Camellia japonica;* the rhizome and roots of *Gentiana scabra* var. *Buergeri;* the root of *Polygala tenuifolia;* the dried rhizome and roots of *Valeriana officinalis* var. *latifolia.*—*E. N. Gathercoal.*

378. Anonymous. [Rev. of: Cross, M. I., and Martin J. Cole. **Modern microscopy.** 5th ed. rev. and rearranged by Herbert F. Angus, with chapters on special subjects by various writers. *x* + *314 p.* Baillière, Tindall and Cox: London, 1922.] Pharm. Jour. **109:** 184. 1922.

379. Anonymous. [Abstract of: Hilton-Simpson, M. H. **Arab medicine and surgery.** *vi* + *96 p.* Oxford University Press: London, 1922.] Pharm. Jour. **109:** 212–213. 1922.—This is a study of the practice of medicine and surgery by the Berber and Arab doctors of the Algerian tribe known as the Shawiya. Medical knowledge is had by apprenticeship, though there are about 8 medical books by Arabs. The treatment is mostly empirical and the surgery is of obscure origin not derived from Greek or Roman sources, but believed to have been practised by the Shawiyas since Neolithic times. Trepanning by roughly made native instruments is quite skillfully performed. No general anaesthetics are employed, but a soporific, such as the seed of *Hyoscyamus alba,* is used. Many other operations are also performed. The materia medica is quite extensive, mostly from local plants, though copper acetate, arsenic sulphide, alum, etc., are obtainable in the shops. Pharmaceutically, a wide variety of preparations are employed, notably suspensions, boluses, pills, mixtures, infusions, inhalations, poultices, ointments, distillations, etc.—*E. N. Gathercoal.*

380. Ajon, G. **Sulle essenze di limone. IV, V.** [Studies on lemon extracts, IV, V.] Ann. R. Staz. Sper. Agrumic. e Fruttic. Acireale **6:** 53–66, 67–76. *5 fig.* 1922.—IV. This is a chemical study of the citral and terpene adulterations of the extracts. The fractional distillation methods are studied.—V. Studies upon the critical melting points of the distillates of the pure and adulterated extracts are reported.—*A. Bonazzi.*

381. Annett, H. E., and Har Dayal Singh. **The loss in morphine content of powdered opium on storage.** Pharm. Jour. **109:** 304–305. 1922.—Samples of powdered Indian opium stored for 4 years lost about 3 per cent of morphine calculated on the dry weight of the opium. The amount of morphine lost seems roughly constant, despite the fact that the original samples contained very different amounts of morphine, viz., 4.9–16.3 per cent. This means that the samples lost from about 12 to over 50 per cent of their original morphine. Samples stored 2–3 years lost 1–2.4 per cent of morphine, calculated on the dry matter of the opium. Samples collected in March, 1921, and stored 10 months have apparently suffered no loss. The loss of morphine may possibly be due to the action of oxidizing enzymes, which have been shown to be present. Since there is evidence that moist opium does not undergo this change, it may be that the dry powder allows free access of air which is necessary for the oxidation process, whereas air cannot diffuse into the moist opium mass.—*E. N. Gathercoal.*

382. B., W. **Hay fever.** Nature **111:** 812–814. 1923.—This article presents a review of the work upon hay fever. First described in 1819, the earlier writers believed it to be caused by effluvia of hay or aroma of flowers. The etiology was established by Charles Blackley in 1873, who carried on careful experiments over a series of years, working chiefly with grass pollens. He made an extensive study of pollen in the air and found that in the upper strata there was 19 times as much pollen as was found near the surface of the earth and 95 per cent was identified as grass pollen. Further study by Dunbar in 1903 added other plants to the list and determined the proteins as the active agent. Wind-borne pollens are normally the ones which are responsible, but under exceptionally dry conditions, pollens which are naturally sticky become dry and are wind blown.—*O. A. Stevens.*

383. Cabellero, Arturo. **Mosquito destruction by a plant.** Pharm. Jour. **109:** 201. 1922.—The larvae of *Stegomyia, Culex,* and *Anopheles* die in any water where *Chara foetida* is found. Young larvae are especially susceptible and those fresh from the egg die within 1 hour. It was first thought that the larvae died because of the film formed on the surface of the water containing *C. foetida;* experiments showed that they died even when the film was removed. The inference is that the action is due to some toxic substance secreted by the Chara plants. —*E. N. Gathercoal.*

384. Chevalier, J., et Fernand Mercier. **Action pharmacodynamique du principe insecticide des fleurs de pyrethre.** [The pharmacological action of the insecticidal principal in flowers of pyrethrum.] Compt. Rend. Acad. Sci. Paris 176: 1847–1848. 1923.—A study of the toxicity of *Chrysanthemum cinerarifolium* is reported.—*C. H. Farr.*

385. Gardner, Hermann C. T. **The preparation of sodium chaulmoograte or gynocardate.** Pharm. Jour. 109: 154. 1922.—The article describes the commercial manufacture of sodium chaulmoograte. Attention is especially called to the fact that factitious chaulmoogra oil obtained from species of *Gynocardia* is quite unsuitable for the preparation of this salt as it contains no true chaulmoogric acid.—*E. N. Gathercoal.*

386. Greenish, Henry G., and Constance E. Pearson. **Santonin—note on the occurrence of.** Pharm. Jour. 109: 85. 1922. [Also in Yearb. British Pharm. Conf. for 1922. *395–398.* 1922.]—*Artemisia brevifolia* from Kashmir in Eastern Thibet contains santonin, the yield being 0.76 per cent, calculated upon the air-dried leaves and stems. *A. mexicana* and *A. redolens* from Mexico yielded no santonin.—*E. N. Gathercoal.*

387. Hecke, Ludwig. **Neue Erfahrungen über Mutterkornkultur.** [New results in ergot culture.] Wiener Landw. Zeitg. 75: 3. 1923.—Opening of the heads was stimulated by brushing the tops with a rod. Infection was secured by spraying the heads with a diluted culture of "honey dew." The latter was secured from winter rye which bloomed about 2 weeks earlier than the summer rye, and bore ergots from natural infection.—*F. Weiss.*

388. Henry, Max, and W. L. Hindmarsh. **Stypandra glauca—a suspected poison plant.** [Abstract.] Agric. Gaz. New South Wales 34: 507. 1923.—Extensive feeding experiments were made with this plant to various animals in 5 different months extending over 3 years. No injurious effects were observed.—*L. R. Waldron.*

389. Holmes, E. M. **Picrolima Klaineana.** Pharm. Jour. 109: 478. 1922.—The seeds are used in Africa as a fever remedy, contain an alkaloid or alkaloids, and have been known for the last 80 years. They are deserving of further therapeutic investigation.—*E. N. Gathercoal.*

390. Holmes, E. M. **The habits of slugs.** Pharm. Jour. 109: 211–212. 1922.—In a review of recent literature on slugs it is noted that these pests, so frequently destructive to growing plants, are extremely sensitive to odor. Apparently not only do they locate food by means of odor but they are extremely sensitive to certain deterrent odors. For instance, it has been found by experiment that *Limax maximus* is sensitive by its tentacle to 1 part of mustard gas in 10,000,000, while man is sensitive only to 1 part in 4,000,000. It is obvious, therefore, that it may be possible to use odorous deterrents to prevent slugs from attacking vegetable and flowering plants, and these will have to be sought among plants that are not attacked by them. *E N. Gathercoal.*

391. Jones, A. J. **Arsenic content of marine algae.** Pharm. Jour. 109: 86-87. 1922. [Also in Yearb. British Pharm. Con. for 1922: 388–395. 1922.]—Of the 11 varieties of seaweed examined all contained arsenic,—7–125 parts per million. The higher arsenic content was found in the coarser varieties such as *Laminaria* and *Fucus* and thus roughly follows the iodine content; the edible seaweeds contained very small quantities. The proportion of arsenic is so small that danger of poisoning is exceedingly remote. Data and method of analysis are given.—*E. N. Gathercoal.*

392. Read, B. E. **A trip through the hills of Chihli, China.** Pharm. Jour. 109: 580–583. 1922.—Cultivated crops, flowers of the plains, the trees, stream and pond life, and hillside flora are described. Many of the plants mentioned are named botanically. Of especial interest are the medicinal plants encountered, viz: *Linum usitatissium, Cannabis sativa, Ricinus communis, Datura Stramonium, Hyoscyamus niger, Mentha arvensis, Punica granatum, Sinapis nigra, Taraxacum officinalis, Arachis hypogaea.* Many other drugs are produced in Central and South China, such as rhubarb, cinnamon, cloves, camphor, liquorice, nux vomica, and cardamoms. With the manufacture in India of santonin from *Artemisia brevifolia,* it becomes of interest to investigate the possibilities of the many Artemisias growing in China—*A. apiacea, A. scoparia, A. vestita, A. vulgaris,* etc.; also possible uses for the Chenopoduims, e.g., *C. album, C. hybridum,* etc., in the scientific treatment of the many varieties of intestinal parasites.—*Papaver somniferum* in some districts covered more space than the cereal crops.

For 600 miles north of Jehol it was planted and reaped. The persimmon (*Diospyros kaki*) fruits, so extensively consumed as food in China, have been found to be very rich in vitamins. —*E. N. Gathercoal.*

393. Rusby, H. H. **The botanical source of coto bark.** Pharm. Jour. **109:** 483. 1922.—Coto bark is one of the few modern drugs of which the botanical origin has been unknown. The author located the source of a true Coto bark and described this plant, a tree 50–60 feet high, naming it *Nectandra Coto* Rusby. Also the botanical source of one of the common substitutes for Coto is located and named *Ocetea pseudo-Coto* Rusby.—*E. N. Gathercoal.*

394. Samaan, Karam. **Contribution to the study of digitalis.** Yearb. British Pharm. Conf. **1921:** 395–403. 1921. [See also Bot. Absts. 10, Entry 730.]

395. Samaan, Karam. **Strophanthus Preussii.** Pharm. Jour. **109:** 83–85. 1922. [Also in Yearb. British Pharm. Conf. for 1922. *379–388.* 1922.]—The article includes the pharmacognosy, determination of the moisture, determination of the fatty oil, and heart perfusion experiments with the tincture. In conclusion the author states that the heart perfusion experiments show the value of the tonic effect of this species of *Strophanthus* to be high. Further, good recovery of the arrested heart was always possible. The seed were obtained from the southern provinces of Nigeria through the Agricultural Department.—*E. N. Gathercoal.*

396. Thompson, C. J. S. **The history of Hiera Picra, one of the oldest known medicaments.** Pharm. Jour. **109:** 177–178. 1922.—This compound, which has been used as a medicine for over 2,000 years, has varied somewhat in composition, and the earliest formula now known is that of Themison of Laodicea, who practised in Rome about 500 B. C Themison's recipe consisted of aloes, 199 drams; saffron, Indian nard, carpobalsam and asarum, of each 1 ounce. Other formulae, in which considerable variations occur, have appeared from time to time during the succeeding centuries. Some contain colocynth and many other drugs are also found. In more recent days the formula is found in all of the pharmacopoeias and formularies of note and was official in the U. S. A. Pharmacopoeia as late as 1870. The medicine is quite extensively used at the present day in Belgium and France, as well as in England and Scotland. The present composition of Hiera picra is essentially aloes and canella.—*E. N. Gathercoal.*

397. Walker, George. **The dosage of Digitalis, Strophanthus, Squill and Nux Vomica.** Pharm. Jour. **190:** 607–609. 1922.—A review of the doses of the British Pharmacopoeia with the doses stated in a number of foreign pharmacopoeias and other standard works of materia medica indicates a very wide variation in maximal doses. A résumé of the doses of Digitalis, Strophanthus, Squill and Nux Vomica is presented. A plea is made for a revision of the British Pharmacopoeia doses.—*E. N. Gathercoal.*

398. Wallis, T. E. **Some characteristics of wheat starch.** Pharm. Jour. **109:** 82–83. 1922. [Also in Yearb. British Pharm. Conf. for 1922. 373–379. 1922.]—To detect the presence of wheat in barley flour, careful counts of the grains 40 μ or greater in diameter is made and the estimation becomes quantitative when the count is made in definite amounts of material. It is necessary, however, to prepare by special process pure wheat starch, also the sample under examination, as follows: 30 gm. of the material is soaked in water for 48 hours to swell the grains thoroughly, and then stirred in a large beaker with 330 cc. of water which should form a depth of about 6 cm. After standing for 1 hour 264 cc. is poured off and 264 cc. of water added. This is repeated 5 times making 6 decantations. The residual starch is filtered out, dried, and powdered. The number of grains 40 μ or over in commercial wheat starch approximates 367 per mgm. of the dried starch, though it seems to be impossible to obtain concordant results without first washing out many of the smaller grains; but after washing as described above the number of grains 40 μ or over was constantly found to be approximately 846 per mgm. of the dried starch. In the discussion, attention is called to the fact that some variations occurs in the size of wheat starch derived from various varieties of wheat, hence the count of grains 40 μ or over might vary.—*E. N. Gathercoal.*

PHYSIOLOGY

B. M. Duggar, *Editor*

William J. Robbins, *Assistant Editor*

(See also in this issue 20, 25, 35, 38, 39, 98, 102, 103, 112, 133, 150, 157, 159, 160, 165, 166, 167, 232, 250, 251, 256, 258, 260, 262, 264, 272, 291, 314, 315, 323, 334, 345, 346, 371, 391)

PROTOPLASM, MOTILITY

399. Ehringhaus, A. **Über objektive Demonstration der Brownschen Molekularbewegung. On the objective demonstration of Brownian movement.**] Naturwissenschaften **11**: 42–43. *Fig. 1–3.* 1923.—A satisfactory projection of Brownian movement was obtained by grinding very finely various substances of a high refractive index (hard flint glass, cinnabar, etc.) and after proper filtering a liquid is obtained with particles of 0.5–5μ diameter in suspension which show a very active movement; with dark field illumination a satisfactory demonstration of the movement may be obtained.—*Orton L. Clark.*

400. Metzner, P. **Studien über die Bewegungsphysiologie niederer Organismen. Studies on physiology of movements of the lower organisms.**] Naturwissenschaften **11**: 365–372, 395–399. *Fig. 1–8.* 1923.

DIFFUSION, PHYSICO-CHEMICAL RELATIONS, PERMEABILITY

401. Bleyer, L. **Über die Trypaflavinaufnahme durch abgetötete Bakterien. Trypaflavin absorption by dead bacteria.**] Biochem. Zeitschr. **136**: 392–402. 1923.—Absorption of trypaflavin (1:100) by *Bacterium coli, Staphylococcus pyogenes aureus, S.p. albus, Bacillus subtilis, B. pneumoniae* Friendländer, *Vibrio* "Finkler," and *V.* "Metschnikoff" which had been killed by heat was compared with absorption by living cultures. The results were irregular and seemed connected with some specific heat effect.—*H. D. Hooker, Jr.*

402. Czapek, Friedrich. **Physikochemische Probleme der Protoplasmaforschung. [Physicochemical problems in investigations on protoplasm.**] Naturwissenschaften **11**: 237–243. 1923.—In this address, delivered on Czapek's succession to Pfeffer's chair at Leipzig, problems of permeability are outlined with a discussion and criticism of Overton's and other theories on selective permeability. Other studies considered are the colloidal consistency of cytoplasm, its electrical nature and viscosity.—*Orton L. Clark.*

403. Fairbrother, Fred, and Harold Mastin. **The swelling of agar-agar.** Jour. Chem. Soc. [London] **123**: 1412–1424. *2 fig.* 1923.—Agar-agar was found not to behave like gelatin as regards swelling in acids and alkalies. Hydrochloric, acetic, sulphuric, oxalic, and phosphoric acids decreased swelling, "the relative swelling at a given value of pH being of the same order in each of the acids." NaOH solutions weaker than about 0.00125 N. increased swelling, but concentrations stronger than about 0.0025 N. decreased it. "Agar-agar consists principally of the calcium salt of an acid sulphuric ester (R. O. $SO_2.O)_2$ CA, which is considered to be ionized in the sol and gel states."—*F. E. Denny.*

404. Hansteen-Cranner, B. **Beiträge zur Biochemie und Physiologie der Zellwand und der plasmatischen Grenzschichten. [Biochemistry and physiology of the cell wall and the adjacent plasma membranes.**] Ber. Deutsch. Bot. Ges. **37**: 380–391. *Pl. 3–4.* 1919.—The author has previously shown that young roots in solutions containing K, Na, or Mg ions become much deformed and finally dissolve. The same thing takes place in distilled water. On the other hand, Ca ions, either when present alone or in definite ratio to the toxic ions, always permit an entirely normal, luxuriant development of roots. The author has shown that the cell-walls of all physiologically active, parenchymous tissues, for instance, bulb scales of *Allium Cepa*, and the flesh of the red beet, contain besides cellulose and hemicelluloses also lipoids and small amounts of phytosterin-like substances. He now shows that these lipoids leach out and make cloudy those solutions which are toxic to the young roots. Dilute solutions of Ca ions (0.01 N solutions) do not permit this leaching; neither do certain equivalent mixtures of Ca ions with the toxic ions. The temperature relations are important, for between 6–16°C. only water-soluble lipoids leach out, while at 30°C. also much water-insoluble lipoid

comes out. The author believes these lipoids line the adjacent plasma membrane and permeate the cell-wall at all places. They thus produce an exceptional colloid system which regulates the absorbtion and permeability relations of the cell. The author suggests that changes in the condition of these lipoids may play a prominent part in the resting period of plants and that they may possibly, since they are so characteristic of the animal nervous system, act as irritant-receiving organs of the plant.—*C. M. Conrad.*

405. Lloyd, D. J., and C. Mayes. **The titration curve of gelatine. Report to the Medical Research Council.** Proc. Roy. Soc. London B **93**: 69–85. 1922.—Combinations of gelatin with HCl and NaOH were studied at various concentrations in an effort to formulate a theory of the chemical change involved. This was held to be essential to a satisfactory theory of the swelling of gelatin in acid and basic media. In acid of less than 0.04 N. acidity the combination with gelatin obeys the law of mass action, K_b for gelatin being 4.8×10^{-2} at 20°C., if 839 be taken as the reacting weight of the same. At greater concentrations the proportion of acid fixed is greater, but this is not due to hydrolysis of the gelatin. In NaOH of less than 0.01 N. the combination of gelatin with the base is less than that calculated from the value of K_b and the isoelectric point at the same combining weight. K_a could not be calculated. In a base at 0.1 N. the molecule seems to change.—*P. B. Sears.*

406. Petri, L. **Azione ionizzante degli enzimi. Ionizing action of enzymes.]** Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e. Nat. **31**^{2}: 50–54. 1922.—Tests were made with a delicate electroscope to determine whether the air in contact with the surface of a liquid containing an active enzyme becomes a conductor of electricity. Considerable ionization was observed, using mixtures of the scutella of seed of *Zea Mays*, which compared with the ionization of the oxide of uranium, the intensity of the current of saturation being estimated as between $.74 \times 10^{-15}$ and $.17 \times 10^{-14}$ amperes per cm^2. With seed of *Soja hispida* the intensity of the current of saturation was calculated approximately as $.44 \times 10^{-15}$ amperes per cm^2.—*F. M. Blodgett.*

407. Prat, S. **Die Elektrolytaufnahme durch die Pflanze. I. Die Resorption von Mineralstoffen durch die Wurzeln. [Electrolyte absorption by plants. The absorption of mineral constituents by roots.]** Biochem. Zeitschr. **136**: 366–376. 1923.—Measurements of the electrical conductivity of Knop's nutrient solution in which *Zea Mays* or *Pisum sativum* seedlings were growing indicated a constant decrease in the total salt concentration under constant illumination, temperature, and transpiration. Experiments with *Zea Mays*, *Pisum sativum*, and *Pharbitis hispida* showed that the rate of absorption is largely independent of transpiration and is correlated with rate of growth of tops more closely than with that of the roots. This occurred both when the nutrient solution was renewed at frequent intervals and when it was not. From pure $\frac{1}{100}$ molar solutions, NaCl and KCl were absorbed in amounts corresponding to the water transpired; $MgCl_2$ and $CaCl_2$ were absorbed in smaller amounts.—*H. D. Hooker, Jr.*

408. Wastl, H. **Über Ionenantagonismus. Antagonism of ions.]** Biochem. Zeitschr. **134**: 131–138. 1922.—Antagonism was observed in the action of anions on the formation of free iodine from HIO_3 in the presence of H_2SO_4.—*H. D. Hooker, Jr.*

409. Zollikofer, Clara. **Über die Wirkung der Schwerkraft auf die Plasmaviskosität. [On the effect of gravity on plasma viscosity.]** Beitr. Allg. Bot. **1**: 449–500. Fig. 1–18. 1918. —The conclusions of G. & T. Weber on the effect of gravity on plasma viscosity were not substantiated; in fact, no relation was found between the plasma viscosity and the direction of the stimulus of gravity.—*Orton L. Clark.*

MINERAL NUTRIENTS AND SALT RELATIONS

410. Noyes, H. A. **Composition basis for considering water requirements of plants.** Jour. Indust. and Eng. Chem. **14**: 227–228. 1922.—The results of field and greenhouse experiments indicate that fertilization of a soil which responds to direct or indirect fertilizer treatment allows the plants to make their growth on a smaller amount of water and to have a different composition from what they otherwise would.—*Henry Schmitz.*

411. Zach, E. **Sull'influenza della diluizione delle soluzioni nello sviluppo delle piante. [Influence of the dilution of the nutritive solutions upon the development of plants.]** Staz.

Sper. Agrar. Ital. 55: 480–486. 1922.—Knop's solution was used in 4 dilutions, the quantity of salts remaining equal in every case, only the volume of the solution being varied. Dry weight and ash of the corn plants grown in the solutions are given; they are, in this limited series, inversely proportional to the concentration of the solution, a fact that leads the author to postulate that the absorption of minerals by a plant is regulated by the laws of adsorption. —*A. Bonazzi.*

PHOTOSYNTHESIS, CHLOROPHYLL

412. Klein, Gustav. **Studien über das Anthochlor II.** [Investigation of anthochlor.] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) I Abt. 130: 247–262. *7 fig.* 1921 [1923].—In an earlier paper [see Bot. Absts. 12, Entry 781] a new group of yellow color substances, collectively anthochlor, was described. Their occurrence in the cell-sap of a number of yellow flowers was noted, and their relationship to the flavones, from which they differ principally in their solubility in water, was shown. The present account extends the knowledge of their distribution showing that, besides in flowers, water-soluble derivatives of flavones are found in fruits, as in the peel of citrus fruits, and in stems and leaves, as in *Dahlia*, *Antirrhinum*, and *Reseda*. The yellow foliage of autumn and of plants which are under unfavorable conditions also contains substances belonging to this group. The dissolved yellow coloring matters in the flowers of *Helichrysum* sp. (helichrysin), of *Carthamus tinctorius* (safflorgelbe), and of *Crocus sativus*, (crocin) are shown to be anthochlors. In yellow-flowered species of *Acacia* the anthochlor occurs in the same cells as a tannin derivative, referred to the group of catechu-glucotannoids. The anthochlors are thus similar in importance and extent to the red flavone derivatives, the anthocyans.—*F. Weiss.*

413. Snow, Oscar Walter, and John Frederick Smerdon Stone. **A note on the photosynthesis of amines.** Jour. Chem. Soc. [London] 123: 1509–1515. *1 fig.* 1923.—Objection is made to the evidence furnished by Baly, Heilbron, and Stern [see Bot. Absts. 12, Entry 1429] regarding the photosynthesis of methylamine pyridine, piperidine, and a coniine-like alkaloid from ammonia and formaldehyde by ultra-violet light. The authors show that methylamine can be formed from the reagents without exposure to light, and that the tests for the other substances were not specific.—*F. E. Denny.*

414. Wurmser, Renè, et Raymond Jacquot. **Sur la relation entre l'etat physique du protoplasma et son fonctionnement. I. Photosynthèse.** [The relation between physical state of protoplasm and its functioning. I. Photosynthesis.] Bull. Soc. Chim. Biol. 5: 305–315. 1923.—Various marine algae, including *Ulva lactuca*, *Codium tomentosum*, *Rhodymenia palmata*, *Laminaria saccharina*, *L. digitata*, and *Iredea edulis* were subjected to temperatures of 36–45°C., for periods of 1–15 minutes and subsequently returned to sea water at 16°C. The rate of photosynthesis was then compared with that of untreated checks, by measuring the changes in O_2 content of the water by the Winckler-Jacobsen method and the changes in CO_2 content both by direct chemical determinations and by the Osterhout-Haas method. In every case there was a progressive suppression of photosynthesis with increase in the temperature employed, and this suppression became absolute and was replaced by absorption of O_2 at a point considerably below the lethal temperature for the particular plant employed. The degree of suppression observed at any given temperature depended upon the time for which heating was continued. The suppression of photosynthesis must be due to a modification of the physiological state of the cell colloids which throws the mechanism responsible for the reduction of CO_2 out of action. The senior author has developed a theory as to the nature of this mechanism in an earlier paper (Wurmser R., Recherches sur l'assimilation chlorophylliene. Arch. Physique Biol. 1: 33. 1921.)—*Joseph S. Caldwell.*

METABOLISM (GENERAL)

415. Anonymous. [Rev. of: Molliard M. **Nutrition de la plante: utilisation des substances ternaires. (Utilization of non-nitrogenous substances by plants). Encyclopédie Scientifique: Bibliotheque de Physiologie et de Pathologie végétales.** *306 p.* Gaston Doin: Paris, 1923.] Nature 111: 770. 1923. [See also Bot. Absts. 12, Entry 3465.]

416. Bertrand, Gabriel. **Projet de réforme de la nomenclature de Chimie biologique.** [Proposed reform of the nomenclature of biological chemistry.] Bull. Soc. Chim. Biol. 5: 96–109. 1923.—This is a preliminary report presented to the French Society of Biological Chemistry on Feb. 20, 1923, by a national committee of 15 biological chemists for discussion and modification prior to its presentation to the 4th international conference at Cambridge.—*Joseph S. Caldwell.*

417. Blumer, S. **Variationsstatistik als Hilfswissenscaft der Biochemie der Pflanzen. III. Variation des Amygdalingehaltes in den Samen einiger Prunusarten.** [Statistics of variation as an aid to plant biochemistry. Variation in the amygdalin content of the seeds of several stone fruits.] Biochem. Zeitschr. 137: 125–132. *3 fig.* 1923.—Homogeneous material obtained from a single tree showed that the percentage amygdalin content of various stone fruits followed a bimodal curve. Random samples gave a curve with several maxima, indicating in the case of apricots and peaches that a morphological species is probably composed of several physiological races. A negative correlation was found generally between seed weight and percentage amygdalin content.—*H. D. Hooker, Jr.*

418. Bridel, Marc. **Étude biochimique sur la composition du Monotropa Hypopitys L.: obtention d'un glucoside nouveau, la monotropéine.** [A biochemical study of the composition of Monotropa Hypopitys : obtaining a new glucoside, monotropine.] Compt. Rend. Acad. Sci. Paris 176: 1742–1744. 1923.—An attempt was made to discover the substance causing blackening in this species. Extracts of stems and leaves were treated with invertin and emulsin and the rotation of the sugars was noted. It was found that the substance was a glucoside which was hydrolyzable with emulsin. The glucoside was crystallized out of the extract, and the properties of this new glucoside, monotropine, were determined.—*C. H. Farr.*

419. Butkewitsch, W. **Über die Bildung der Citronensäure in den Kulturen von Aspergillus niger und Penicillium glaucum auf Zucker.** [Citric acid formation in sugar cultures of Aspergillus niger and Penicillium glaucum.] Biochem. Zeitschr. 136: 224–237. *3 fig.* 1923.—Calcium citrate accumulated in cultures of *Aspergillus niger* on sugar in the relative absence of oxygen and in the presence of calcium carbonate. This occured at temperatures ranging from 14 to 26°C. Oxalic acid was also formed. Cultures of *Citromyces glaber* produced less citrate and oxalic acid and the latter appeared only in old cultures. An unknown acid was produced, the production passing through a maximum. It is thought that this acid gives rise to citric and oxalic acid. In the presence of an excess of nitrogen, less acid was formed, presumably as a result of the increased utilization of sugar. Smaller amounts of citric and oxalic acid were formed in cultures of *Penicillium glaucum.* This is attributed to greater oxidation of these acids. Under optimum conditions, cultures of *Aspergillus niger* converted 30 per cent of the consumed sugar to citric acid, and no oxalic acid was formed. No physiological difference is considered to exist between oxalic acid-producing and citric acid-producing fungi.—*H. D. Hooker, Jr.*

420. Calvino, Eva Mameli. **I peli urenti della Mucuna pruriens DC.** [The stinging hairs of Mucuna pruriens.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 31²: 166–172. *fig. 1–6.* 1922.—The stinging hairs of *Mucuna pruriens* were found to have strongly silicated membranes at the apices and to be covered with numerous barbs. The cell contents contained an oily substance soluble in alcohol, benzine, ether, carbon bisulphide, chloroform, and acetone. This oil is a fatty oil and not an essential oil, and it is probably a mixture of glycerides of various fatty acids. There is an acid present not soluble in water but soluble in alcohol, acetone, and ether.—*F. M. Blodgett.*

421. Calvino, Eva Mameli. **Ulteriori osservazioni su i peli urenti della Mucuna pruriens DC.** [Further observations on the stinging hairs of Mucuna pruriens.] Att. R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 31²: 195–200. 1922.—The stinging hairs of *Mucuna pruriens* are compared with those of *M. urens* Medic. and *Stizolobium capitatum.* There are appended lists of Antillean species that contain (1) irritating substances in hairs or trichomes and (2) a latex or resin in vessels or canals that is a counter irritant.—*F. M. Blodgett.*

422. Ciamician, Giacomo, et C. Ravenna. **Sur la signification biologique des alcaloides chez les plantes.** (Translation from the Italian by R. Cerighelli.) [The biological significance of alkaloids in plants.] Bull. Soc. Chim. Biol. 5: 59–78. 1923.—This is a résumé of

Ciamician's numerous papers upon the functions of alkaloids in plants. Alkaloids are regarded as possessing regulatory functions in the life of the plant analogous to those of the animal hormones.—*Joseph S. Caldwell.*

423. Colin, H., et H. Belval. **Sur les prétendues dextrines de réserve des Monocotylédones. [On the so-called dextrins stored in monocotyledons.]** Compt. Rend. Acad. Sci. Paris **176**: 1493–1495. 1923.—A study is made of the carbohydrates stored in the bulb of *Hyacinthus orientalis*. It is stated that many books on plant chemistry and physiology have copied the table of carbohydrates given by Leclerc du Sablon in 1898 in which he showed the relative amounts of reducing sugars, non-reducing sugars, dextrins, and starch in these bulbs. The present study shows that the so-called dextrins, are, however, levulosans. The same condition has been found in several species of *Scilla*.—*C. H. Farr.*

424. Currey, Geoffrey. **The colouring matter of red roses.** Proc. Roy. Soc. London B **93**: 194–197. 1922.—The anthocyan pigment of the red rose "George Dickson" is shown to be the di-glucoside cyanin, present as an oxonium salt (in combination with a plant acid.) In addition there is present a yellow glucoside sap pigment not yet identified.—*P. B. Sears.*

425. Delauney, P. **Sur la présence de la loroglossine dans onze nouvelles espèces d'Orchidées indigènes. [Presence of loroglossin in eleven new species of indigenous orchids.]** Bull. Soc. Chim. Biol. **5**: 398–408. 1923.—To the 5 species previously reported by the author [see Bot. Absts. 12, Entry 5193] as containing loroglossin, are now added *Epipactis latifolia* All., *E. atrorubens* Hoffm., *Ophrys muscifera* Huds., *Orchis pyramidalis* L., *O. conopsea* L., *O. purpurea* Huds., *O. morio* L., *O. maculata* L., *O. latifolia* L., *O. mascula* L., and *O. militaris* Huds. Of the 5 genera from which loroglossin has been isolated, 3, *Loroglossum, Orchis*, and *Ophrys*, are bulbous rooted while 2, *Cephalanthera* and *Epipactis*, are not.—*Joseph S. Caldwell.*

426. Franzen, H., und F. Helwert. **Über die chemischen Bestandteile grüner Pflanzen. XXVI. Kritisches über das Vorkommen der Weinsäure in den Pflanzen. [The chemical constituents of green plants. The occurrence of tartaric acid.]** Biochem. Zeitschr. **136**: 291–305. 1923.—A critical survey of the literature shows that tartaric acid has been demonstrated to occur in only 5 out of 82 plants, namely: in the fruit of *Vitis vinifera, Tamarindus indica*, and *Pirus Aucuparia;* in the sap of *Acer saccharinum;* and in the unripe roots of *Beta vulgaris*. It probably occurs also in the wood of *Quercus pedunculata*.—*H. D. Hooker, Jr.*

427. Franzen, H., und R. Ostertag. **Über die chemischen Bestandteile grüner Pflanzen. XXVII. Kritisches über das Vorkommen der Bernsteinsäure in den Pflanzen. [Chemical constituents of green plants. The occurrence of succinic acid.]** Biochem. Zeitschr. **136**: 327–333. 1923.—A critical survey of the literature indicates that succinic acid occurs certainly in *Chelidonium majus*, in the tops of *Artemisia Absynthium*, in the leaves of *Atropa Belladonna, Rubus Idaeus*, and *Echeveria secunda glauca*, in yellowed leaves of *Anemone nemorosa*, in petioles of *Rheum officinale*, in the fruit of *Prunus avium* and *Pirus Aucuparia*, and in unripe berries of *Vitis vinifera*. Its presence in the leaves of *Lactuca virosa* and *L. sativa* and in the stem of *Musa Basjoo* is probable.—*H. D. Hooker, Jr.*

428. Gillot, P. **Sur les variations de quelques réserves hydrocarbonées dans la Mercuriale vivace (Mercurialis perennis L.) [Concerning variations in certain carbohydrates stored in Mercurialis perennis.]** Compt. Rend. Acad. Sci. Paris **176**: 1657–1659. 1923.—A study is made of the carbohydrates stored in the storage organs of this plant. It is found that there is the same relationship between starch and saccharose as is characteristic of most plants. In addition it is found that maltose is here a storage form of sugar, and not simply a transitional form, as is usually the case.—*C. H. Farr.*

429. Goris, A. **Sur la composition chimique du Monotropa Hypopitys L. [On the chemical composition of Monotropa Hypopitys.]** Compt. Rend. Acad. Sci. Paris **176**: 1826–1828. 1923. —This paper confirms the finding of monotropine by Bridel in this plant [see Bot. Absts. 13, Entry 418]. It also records the presence here of another glucoside in addition to those already reported.—*C. H. Farr.*

430. Hagen, Fritz. **Zur Physiologie des Spaltöffnungsapparates. [The physiology of stomata.]** Beitr. Allg. Bot. **1**: 260–291. 1918.—These studies are based on an inquiry into the influence of the contents of the guard cells on the degree of opening of the stomata. In the determination of the sugar content the method of Lidforss was used, while for the tannins

an original method was developed. The starch in the guard cells proved to be very resistant to adverse conditions (darkening, decay, and air free of CO_2). Where the stomata were wide open sugar was found in large amounts. Treatment with diastase caused a conversion of starch in the guard cells to sugar with a resulting opening of the stomata. The stomata of winter-hardy leaves are usually closed, show no starch in the guard cells, but in place of it oils, sugar, or tannin. The presence of oil prevents the accumulation of osmotically active sugar within the guard cells. An examination of the stomata of plants kept in a cool house showed similar conditions to those of the hardy out-of-door plants. The movements of the stomata are influenced by the turgidity of the guard cells as well as that of the surrounding epidermal cells.—*Orton L. Clark.*

431. Hirst, Edmund Langley, and Clifford Burrough Purves. **The structure of the normal monosaccharides. Part I. Xylose.** Jour. Chem. Soc. [London] 123: 1352–1360. 1923.

432. Hjort, Johan. **Observations on the distribution of fat-soluble vitamines in marine animals and plants.** Proc. Roy. Soc. London B 93: 440–449. 1922.—In northern waters growth of fish, notably herring and cod, is restricted to spring and summer months. This is thought to be connected with the sudden development of plankton as warm weather approaches. In preliminary experiments the existence of fat-soluble vitamins (growth-promoting) has been demonstrated in *Ulva*, *Codium*, and plankton diatoms, as well as in shrimps, prawns, and the roe of cod and herring.—*P. B. Sears.*

433. Karrer, P. **Der Aufbau der polymeren Kohlenhydrate. [The structure of the polymeric carbohydrates.]** Ergebn. Physiol. 20: 433–476. 1922.—As a result of his studies Karrer holds that the polymeric polysaccharids are formed from the changing over of the mono- or disaccharid anhydride nucleus to the polymeric nuclei $(C_{12}H_{20}O_{10})x$ and $(C_6H_{10}O_5)x$; these, through further affinity forces, unite to form crystals of starch or cellulose. The structure of the polymeric polysaccharid is explained not through chain formation but by a steadily increasing size of the nucleus.—*Orton L. Clark.*

434. Killian, Ch. **Coefficients d'utilisation et vitesse de croissance chez les champignons. [The coefficients of utilization and growth of fungi.]** Compt. Rend. Acad. Sci. Paris 176: 1828–1830. 1923.—A study is made of *Penicillium glaucum* and *Cladosporium herbarum*, and the results compared with those from *Aspergillus niger*. Values are derived for *U* (coefficient of utilization of food) and *P* (rate of growth as measured by dry weight increase per day). Tests are made with different sources of nitrogen, and also with different sources of carbon using $(NH)_2SO_4$ and KNO_3 respectively as sources of nitrogen. It is found that there is little, if any, correspondence between *U* and *P;* neither the one nor the other can thus be taken as a criterion alone of the nutritive value of a substance.—*C. H. Farr.*

435. Klein, Gustav. **Die Verbreitung des Hesperidins bei den Galieae. [The distribution of hesperidin in Galium.]** Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. 130: 295–306. 1921 [1923].—The presence of the glucoside hesperidin, which has not hitherto been reported to occur in the Rubiaceae, has been determined in 7 species of *Galium*, and it was absent from 28 others. Its occurrence does not depend on environmental conditions but is characteristic of certain strains of the species; these possess it in varying degree under all conditions, while other strains always lack it. This is a further example of the existence of chemically distinct races within a morphological species.—Hesperidin is deposited as sphaerites in cold chloral hydrate following treatment of the plant parts, especially the petals, with warm 10 per cent HCl.—*F. Weiss.*

436. Kondo, M. **Über die Bildung des Mercaptans aus l-cystin durch Bakterien. [The bacterial formation of mercaptan from l-cystine.]** Biochem. Zeitschr. 136: 198–202. 1923.—In the presence of glucose, lactose, sucrose, glycerine or histidine *Proteus vulgaris* produced mercaptan from l-cystine. H_2S was always produced from l-cystine by *Proteus vulgaris* and *Bacterium coli*. Ethyl sulphide was also produced.—*H. D. Hooker, Jr.*

437. Maltby, John Gwilliam. **Optical rotations of the sugars. Part II. The methyl pentoses and the glucosides.** Jour. Chem. Soc. [London] 123: 1404–1409. *1 fig.* 1923.

438. Mayer, P. **Zur Methodik der quantitativen Bestimmung des Hefeglykogens und zur Frage der Alkaliwirkung auf die Glykogenbildung in der Hefe. [Quantitative determination of yeast glycogen and the effect of alkali on its formation.]** Biochem. Zeitschr. 136: 487–497.

1923.—The importance of removing yeast gum in making quantitative estimations of yeast glycogen is emphasized. The precipitate thrown down by alcohol is dissolved in water and $(NH_4)_2SO_4$ added to saturation, whereby the glycogen is precipitated and the gum remains in solution. No change in glycogen content was produced by growing yeast in alkaline water or Karlsbad water.—*H. D. Hooker, Jr.*

439. Obaton, Fernand. **Recherches expérimentales sur le rougissement des cerises. [Experiments on the reddening of cherries.]** Compt. Rend. Acad. Sci. Paris **176**: 1824–1825. 1923.—These experiments show that the reddening of cherries depends upon temperature and not upon light. It is also found that the fruits which redden are the seats of oxygen fixation. The experiments were performed by placing a dark box over the cherry twigs. It is stated that cherries reddened in the dark are, however, a little less red than those under natural conditions.—*C. H. Farr.*

440. Palladin, A. **Enthält der Buchweizen alle dem wachsenden Organismus notwendigen Nahrungsfaktoren? [Does buckwheat contain all the nutrients essential to growth?]** Biochem. Zeitschr. **136**: 346–352. 1923.—Experiments show that buckwheat meal contains enough water-soluble A but not fat-soluble B. Its proteins are inadequate and its salt content insufficient for the growth of mice.—*H. D. Hooker, Jr.*

441. Palladin, A. **Über den Gehalt des Leinöls an "Fettlöslichem Faktor A." [The fat-soluble A content of linseed oil.]** Biochem. Zeitschr. **136**: [339–345. 1923.—Experimental evidence is given to show that linseed oil lacks fat-soluble A though flax seeds contain appreciable amounts.—*H. D. Hooker, Jr.*

442. Rosenthaler, L. **Variationsstatistik als Hilfswissenschaft der Biochemie der Pflanzen. [Statistics of variation as an aid to plant biochemistry.]** Biochem. Zeitschr. **134**: 225–233. *4 fig.* 1922.—In bitter almonds and apricot kernels an inverse correlation was found between hydrogen cyanide nitrogen and total nitrogen. In seeds of *Schleichera trijuga* Willd. they ran parallel. In cherry-laurel leaves the absolute hydrogen cyanide content increased with leaf development. The proportion of hydrogen cyanide nitrogen to total nitrogen decreased with age. In cola seed a constant ratio was found between the percentage of caffein nitrogen and of protein nitrogen.—*H. D. Hooker, Jr.*

443. Rosenthaler, L. **Variationsstatistik als Hilfswissenschaft der Biochemie der Pflanzen. [Statistics of variation as an aid to plant biochemistry.]** Biochem. Zeitschr. **136**: 482–484. 1923.—The amygdalin content of each 1 of 100 peach seed from 1 tree was calculated from the hydrogen cyanide content. The results show an instance of fluctuating variation in a chemical constituent. The amygdalin content of the 50 heavier seed averaged 5.31 per cent; that of the 50 lighter seeds was 6.47 per cent.—*H. D. Hooker, Jr.*

444. Rosenthaler, L. **Zur Prüfung der Treubschen Hypothese. [A test of Treub's hypothesis.]** Biochem. Zeitschr. **134**: 215–224. 1922.—Traces of hydrogen cyanide were found in 56 out of 88 plants investigated. Since plants of *Sorghum nigrum* treated with tyrosin solution contained more hydrogen cyanide than check plants, Treub's hypothesis is considered disproved, at least for this plant.—*H. D. Hooker, Jr.*

445. Sjollema, B. **Ergebnisse und Probleme der modernen Ernärhungslehre. [Results and problems of modern nutrition studies.]** Ergebn. Physiol. **20**: 206–406. 1922.

446. Stephenson, M., and M. D. Whetham. **Studies in the fat metabolism of the timothy grass bacillus.** Proc. Roy. Soc. London B **93**: 262–280. 1922.—The organism was grown on inorganic salts, ammonia, sodium acetate, and glucose. Growth, protein nitrogen increase, and lipoid synthesis were followed and a definite relation to consumption of acetate and glucose was found. Intermediate decomposition products of glucose could not be detected. Lactic acid, but not acetic, can be used in place of glucose. Acetic acid can be made available by means of lactic acid or glucose, however. When acetic acid is used in this way it serves for lipoid synthesis, not for general growth. The organism grows on butyric and propionic acids as well as on lactic.—*P. B. Sears.*

447. Visco, Sabato. **Sul valore alimentare dei semi dell'Ervum Ervilia. [The alimentary value of seeds of Ervum Ervilia.]** Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. **31**[2]: 131–137, 203–207, 445–449. 1922.—Feeding experiments with rats are detailed showing that the seed of *Ervum Ervilia* are deficient in some amino acid, that they contain the ac-

cessory factor A, also no toxic substance. When fed to guinea pigs the seed showed a lack or deficiency of indispensable amino acids and of accessory factor C. The last instalment gives a general review of the work published in detail in 6 earlier papers showing that the seed of *Ervum Ervilia* contain sufficient inorganic food substances but are deficient in certain nitrogenous ones. They contain the accessory factor A, a small quantity of accessory B, and are lacking or deficient in C.—*F. M. Blodgett.*

448. Walbum, L. E. **Studien über die bakteriellen Toxine. III. Bildung des Diphtherietoxins. [Bacterial toxins. The formation of diphtheria toxin.]** Biochem. Zeitschr. **134:** 601–605. 1923.—The toxicity of filtered diphtheria toxin or of an extract of inoculated diphtheria bacilli was increased by mixing with peptone bouillon or with a solution of Witte's peptone. The increase was due to the formation of diphtheria toxin. The albumoses of peptone are thought to activate protoxins excreted by the living bacilli.—*H. D. Hooker, Jr.*

METABOLISM (NITROGEN RELATIONS)

449. Issatschenko, B. **Zur Frage über das Vorkommen von Volutin bei Azotobacter chroococcum. [The occurrence of volutin in Azotobacter chroococcum.]** Centralbl. Bakt. II Abt. **57:** 271–272. 1922.—The author refers to the recent work of Ernst Willy Schmidt [see Bot. Absts. 8, Entry 2172] and calls attention to the fact that Giljarowsky in a Russian publication 10 years previous mentioned the occurrence of volutin in this organism.—*Anthony Berg.*

450. Iwanoff, N. N. **Über das Viscosin der Pilze. [Viscosin of fungi.]** Biochem. Zeitschr. **137:** 320–330. 1923.—Unripe fruiting bodies of *Lycoperdon piriforme* contained 11–25.8 per cent of viscosin. Viscosin contained 6.12–6.51 per cent total nitrogen and 0.98–1.14 phosphorus. On hydrolysis, a reducing substance was obtained and 92 per cent of the nitrogen was in the form of amino-nitrogen. Viscosin is considered a precursor of chitin. From ripe fruting bodies substances were isolated with a nitrogen content ranging from 5.37 to 6.72 and 0.94–3.94 per cent phosphorus. These substances yielded glucosamine on hydrolysis.—*H. D. Hooker, Jr.*

451. Iwanoff, N. N. **Über den Harnstoffgehalt der Pilze. [The urea content of fungi.]** Biochem. Zeitschr. **136:** 1–8. 1923.—The urea content of *Lycoperdon saccatum, L. piriforme, L. gemmatum, L. molle, L. marginatum, L. echinatum, Bovista nigrescens, Psalliota campestris, Pholiota spectabilis,* and *Cortinarius violaceus* was determined. This constituted as much as 11.16 per cent of the dry weight in *Bovista nigrescens.* Urea was found to be absent in early stages of development. It increased until a maximum was reached at the beginning of ripeness and diminished thereafter until it was again absent at full ripeness.—*H. D. Hooker, Jr.*

452. Iwanoff, N. N. **Über die Bildung des Harnstoffs in Pilzen. [Urea formation in fungi.]** Biochem. Zeitschr. **136:** 9–19. 1923.—Experiments with several species of *Lycoperdon* showed that urea was formed from available ammonia. The accumulation of urea is compared to asparagin and glutamin formation and like them is supposed to be a nitrogenous reserve.—*H. D. Hooker, Jr.*

453. Iwanoff, N. N. **Über die Natur des Eiweisstoffes der Pilze. [On the nature of fungous proteins.]** Biochem. Zeitschr. **137:** 331–340. 1923.—Ripening fruiting bodies of *Lycoperdon piriforme* contain a protein which is considered to be a phosphorus-containing gluco-protein. Two hydrolytic products were obtained by treatment with 2 per cent H_2SO_4, by pepsin digestion or by warming with strong HCl: an alcohol-soluble peptone-like substance which was precipitated by phospho-tungstic acid and a substance insoluble in alcohol which contained phosphorus and yielded glycosamine on hydrolysis. The mother compound was also isolated.—*H. D. Hooker, Jr.*

454. Kurono, K. **Über die Umwandlung tertiarer α-Aminosäuren durch Hefe. Ein Beitrag zur Lehre vom biochemischen Abbau der Aminosäuren. [The transformation of tertiary α-amino acids by yeast. The biochemical decomposition of amino-acids.]** Biochem. Zeitschr. **134:** 424–433. 1922.—Fermentation of *dl*-methylpropyl-*d*-aminoacetic acid gave an optically active form of this tertiary amino acid and methylpropyl carbinol. Methylpropyl ketone is considered to be an intermediate product.—*H. D. Hooker, Jr.*

455. Smirnow, A. I. **Über die Synthese der Säureamide in den Pflanzen bei Ernährung mit Ammoniaksalzen.** [**The synthesis of acid amides in plants supplied with ammonium salts.**] Biochem. Zeitschr. **137**: 1–34. *6 fig.* 1923.—Etiolated *Hordeum sativum* seedlings grown in NH_4Cl solution showed an increased amide content indicating assimilation of the ammonia. This proceeded most rapidly the 1st day and decreased with the disappearance of carbohydrate. Calcium salts increased the amount assimilated at first and decreased the amount later. Protein hydrolysis was also increased. Storage of ammonia-nitrogen increased as ammonia absorption decreased which is considered dependent on carbohydrate consumption. Etiolated *Lupinus angustifolius* seedlings were grown in ammoniacal nutrient solutions with and without glucose. These plants, poor in reserve carbohydrates, absorbed more ammonia and stored less when supplied with glucose, and after 27 days contained more amide nitrogen and more protein nitrogen. When 13 days old, the seedlings supplied with glucose had a higher amino-acid content, but this decreased as the protein content increased. The ratio of amide nitrogen to ammonia nitrogen in the seedlings supplied with glucose was always twice as great as where glucose was not supplied. Experiments with *Zea Mays* seedlings indicated that asparagin was formed from malic acid and from succinic acid in the presence of ammonia nitrogen.—*H. D. Hooker, Jr.*

456. Voicu, J. **L'effet de humus à faibles et à fortes doses sur la fixation de l'azote par l'Azotobacter chroococcum.** [**The effect of humus in feeble and in strong doses on the fixation of nitrogen by Azotobacter chroococcum.**] Compt. Rend. Acad. Sci. Paris **176**: 1421–1424. 1923.—The small doses given were 0.1–5 mgm. per 100 gm.; the large doses were 100–200 gm. per 100. In general the stronger the dose the more nitrogen is fixed; also more sugar is consumed and more nitrogen is fixed per gm. of sugar consumed in the stronger doses. However there is very little difference in the amount of nitrogen fixed per gm. of sugar consumed among the different variations of the small dosage.—*C. H. Farr.*

457. Zikes, Heinrich. **Beitrag zum Volutinvorkommen in Pilzen.** [**The occurrence of volutin in fungi.**] Centralbl. Bakt. II. Abt. **57**: 21–45. 1922.—This is a study of the nature of volutin and of the physiological factors concerned in its production in fungi. A large number of fungi, mostly yeasts, were studied in this respect and volutin in moderate amounts was found in nearly all. It was most abundant in the beer yeasts and mycoderma. In the wine yeasts the amount is appreciably smaller. In apiculatus yeasts little or none was found. The formation of volutin is stimulated by the addition of peptone. Ammonium sulphate and asparagin are less favorable. The presence of phosphorus is essential for its formation. Glucose and fructose are more favorable than the carbohydrates of higher molecular weight. In the young cells volutin occurs in small droplets which later unite into larger ones. In the old cell it disappears. The optimum temperature for volutin formation is about 30°C. Volutin is an albuminous substance similar to the nucleoprotein, as it contains both phosphoric acid and nuclein.—*Anthony Berg.*

METABOLISM (ENZYMES, FERMENTATION)

458. Akamatzu, S. **Über das Verhalten von Hefefermente gegen höhere Temperaturen.** [**The reaction of yeast enzymes to high temperatures.**] Biochem. Zeitschr. **137**: 364–371. *1 fig.* 1923.—An acetone preparation of yeast showed zymase and carboxylase activity after heating to 120°C. in toluene for ½ hour. Treatment with boiling xylol for 15 minutes did not destroy the activity of either enzyme, though treatment for ½ hour did. Carboxylase activity was affected by heat less than zymase activity.—*H. D. Hooker, Jr.*

459. Bach, A., und A. Oparin. **Über die Fermentbildung in keimenden Pflanzensamen.** [**Enzyme formation in germinating seeds.**] Biochem. Zeitschr. **134**: 183–189. 1922.—The amounts of catalase, peroxidase, and oxygenase in wheat and sunflower seeds were greater than the amounts of amylase or protease both during the rest period and during germination. During germination the amounts of each enzyme passed through a maximum. In wheat this was reached in 3–4 days by catalase and in 6–8 days by the other enzymes; in sunflower seed all enzymes reached their maxima in 6–7 days. Sunflower seed contained more catalase than wheat but less of the other enzymes. Protease activity was expressed in terms of 0.1 N H_2SO_4: all other enzyme activity in terms of 0.1N $KMnO_4$ solution.—*H. D. Hooker, Jr.*

460. Davis, A. L. **Acetone, butanol and ethanol in gas from the butyric fermentation of corn.** Indust. and Eng. Chem. 15: 631–632. 1923.

461. Dernby, K. G., und S. Sieve. **Die proteolytischen Enzyme der Diphtheriebazillen und ihre Bedeutung für das Wachstum und die Toxinbildung derselben. [Proteolytic enzymes in diphtheria bacilli and their relation to growth and toxin formation.]** Biochem. Zeitschr. 124: 3–18. *3 fig.* 1922.—The proteins and peptones for bouillon were hydrolyzed by diphtheria bacilli cultured in it. The hydrolysis was observed after 4–6 days of growth and was thought to be associated with autolytic decomposition. Proteolytic enzymes that showed maximum activity in hydrolyzing petptone at pH 6–7 were found in autolysed bacilli that had been pulverized. No extracellular enzymes were found in the filtered bouillon, which indicates the advisability of growing the organisms on bouillon rich in protein cleavage products. The decrease in the strength of toxin in old cultures is attributed to the action of autolytic enzymes rather than to increased alkalinity.—*H. D. Hooker, Jr.*

462. Drogoul, G. **Sur processo di panificazione secondo il metodo proposto da E. Monti. [The Monti process of bread manufacture.]** Staz. Sper. Agrar. Ital. 55: 303–317. 1922.—The treatment of the lignocellulose of bran with mineral or organic acids together with enzymes brings about noticeable changes, both chemical and histological. From a chemical standpoint the action of acids and enzymes leads to a cleavage of lignified substances of the finely milled bran into free cellulose and hemicellulose so that all or nearly all the undigestible substances disappear and are replaced by simpler carbohydrates. The Monti process is therefore a rational process which allows of the preparation of a high quality bread from a 90 per cent flour. Tartaric acid, HCl, and grape juice were used.—*A. Bonazzi.*

463. Fabre, Renè. **Les méthodes actuelles de purification des enzymes par adsorption. [Present methods for purification of enzymes by adsorption.]** Bull. Soc. Chim. Biol. 5: 432–448. 1923.—This is a review of the more recent work which deals especially with the results obtained by Willstätter and his students.—*Joseph S. Caldwell.*

464. Fred, E. B., W. H. Peterson, and J. A. Anderson. **Production of acetone, alcohol and acids from oat and peanut hulls.** Indust. and Eng. Chem. 15: 126. 1923.—The hulls were hydrolyzed with 2 per cent H_2SO_4, the acid neutralized, and the resulting sugar concentrated. When oat hulls were fermented with *Bacillus acetoethylicus* about 3.9 pounds of acetone, 7.2 of ethyl alcohol, and 1.4 of volatile acid were obtained per 100 pounds of hulls. The yields obtained from peanut hulls were not so high as those obtained from oat hulls.—*Henry Schmitz.*

465. Giacanelli, E. **Sulla presenza delle aldeidi nei vini solfitati e sulla fase aldeidica nella fermentazione deloo zucchero. [Presence of aldehydes in wines treated with sulphites, and the aldehyde phase of alcoholic fermentation of sugar.]** Staz. Sper. Agrar. Ital. 56: 112–123. 1923.—In this survey of various types of wine with respect to their composition and aldehyde content it was found that white wines yield a greater quantity of acetaldehyde than red wines. A repetition of the work of Paris [see Bot. Absts. 13, Entry 477] confirms the conclusions of this author as well as the theory of Neuberg and leads to the conclusion that aldehydes are formed as a 1st step in alcoholic fermentation and can be fixed in the solution by using sulphurous acid salts.—*A. Bonazzi.*

466. Haberlandt, G. **Mikroskopische Untersuchungen über Zellwandverdauung. [Microscopic studies on the digestion of cell walls.]** Beitr. Allg. Bot. 1: 501–535. *Pl. 1.* 1918. —These studies, initiated because of the importance of the food problem during the war, were carried out with man, dogs, cattle, sheep, horses, snails, and caterpillars. The condition of the cell walls from various plant sources (cabbage leaves, birchwood chips, hazelnut shells, etc.) was studied before and after digestion. If the cell walls are not fully digested, they may show swelling or local or general corrosion. Local corrosion is due to the activity of intestinal bacteria. General disorganization of the cell wall also may be due to bacterial action, but the effect of the cellulose-dissolving enzymes secreted by the digestive tract of the animals plays an important part. The dependence of its digestion on the chemical nature of the cell wall is shown in many ways. The cell walls most easily digested are those of relatively pure cellulose (true cellulose, hemicellulose, pentosans.) The walls of the palisade cells and spongy parenchyma are most easily digested, then follow the radial and inner walls of the epidermis,

the walls of collenchyma, and finally the phloem, the cell walls of which are very resistant. Lignified cell walls are more digestible than has been supposed. Cutinized walls are wholly indigestible. The difference between man and the other forms in the action of digestion on cell walls are discussed. Finally, Haberlandt points out that the amylolytic and proteolytic enzymes of the intestines may diffuse through the cell wall and dissolve the cytoplasm almost entirely; chloroplasts remain but may show some disorganization; and the nucleus, with the exception of the nuclear membrane, may be entirely dissolved.—*Orton L. Clark.*

467. Katô, N. **Studien über den Einfluss des Glykokolls auf die Fermentwirkung eines Soja-Ureasepräparates. I. Über die Beziehungen zwischen Harnstoff Konzentration und Ureasewirkung und den Einfluss des Glykokolls auf dieselben. [The influence of glycocoll on the activity of soy-bean urease. The relation between urea concentration and urease activity as affected by glycocoll.]** Biochem. Zeitschr. **136**: 498–529. 1923.—For any given amount of soy-bean urease a concentration of urea was found at which a maximum amount of ammonia was produced. This concentration was constant for any one urease preparation, and independent of temperature. The relative amount of ammonia produced at other concentrations of urea had a constant relation to the optimum. This relation was affected by temperature changes. The optimum concentration was greater when the amount of urease was increased. The amount of ammonia produced at the optimum concentration of urea was constant for a given urease preparation. The addition of small amounts of glycocoll at temperatures below 35°C. increased this optimum concentration, though the maximum ammonia production was the same. At concentrations above the optimum relatively more ammonia was produced. At higher temperatures relatively more ammonia was produced at all concentrations, the maximum also being greater. When more glycocoll was added, ammonia production was increased at concentrations above the optimum only, unless the temperature was high. Glycocoll is thought to form some compound with urea.—*H. D. Hooker, Jr.*

468. Koch, A., and Alice Oelsner. **Über Nucleoproteid spaltende Bakterien und ihre Bedeutung für die Erschliessung des Phophorkapitals im Ackerboden. [Bacteria that hydrolyze nucleoproteins and their significance in augmenting the phosphorus content of soils.]** Biochem. Zeitschr. **124**: 76–96. 1922.—Several soil bacteria were isolated that produced inorganic phosphorus from nucleoprotein, nuclein, and nucleic acid. In the presence of lime, nucleic acid and inorganic phosphorus were formed from nuclein, and the action of the bacteria was favored. Part of the phosphate that would thus be produced in soils is considered directly available to plants; part is absorbed by the bacteria and would become available after their death. Organic and inorganic phosphorus were differentiated by means of ammonium molybdate in acid solution. Zsigmondy's membrane filter was used to separate the bacteria from their culture solution.—*H. D. Hooker, Jr.*

469. Kokichi, O., and M. B. Church. **Industrial mold enzymes.** Indust. and Eng. Chem. **15**: 67–70. 1923.—Various species and strains of *Aspergillus* were grown on different substances. The ratio of amylase and protease does not seem to vary much with the culture medium. Practically all the intracellular enzymes pass out into the culture medium soon after spore formation. Extracellular enzymes continue to increase as long as the mycelium shows an increase.—*Henry Schmitz.*

470. Koříněk, J. **Über den Einfluss der pflanzlichen Lipasen auf das Mycobacterium tuberculosis poikilothermorum L. N. [The action of plant lipases on Mycobacterium tuberculosis poicilothermorum L. N.]** Biochem. Zeitschr. **136**: 530–536. 1923.—Friedmann's *Mycobacterium* became autolysed in boiled water with an acid reaction in 2–3 weeks at 37°C. Castor bean lipase had no effect. Autolysis was retarded slightly by 0.02 per cent lactic acid and delayed considerably by 2 per cent lactic acid. Involuted forms appeared in the presence of lipase.—*H. D. Hooker, Jr.*

471. Laquer, Fritz. **Einiges über die physiologische Bedeutung der Phosphorsäure. [On the physiological importance of phosphoric acid.]** Naturwissenschaften **11**: 300–304. 1923. —A discussion is included of the rôle of phosphoric acid salts in alcoholic fermentation.—*Orton L. Clark.*

472. Lövgren, S. **Studien über die Urease. II. [Studies on urease.]** Biochem. Zeitschr. **137**: 206–257. *22 fig.* 1923.—The optimum hydrogen ion concentration for urease

activity was found to vary with the concentration of urea. A formula is derived to calculate this optimum from the urea concentration. The optimum was independent of enzyme concentration, of phosphate concentration, and of reaction time. A new formula for urease activity is derived to replace the Van Slyke equation.—*H. D. Hooker, Jr.*

473. Mazzei, A. **Contributo sperimentale allo studio sull'influenza della temperature nella fermentazione dei vini spumanti.** [**Influence of temperature on the fermentation of wines with a high CO_2 content.**] Staz. Sper. Agrar. Ital. **55**: 292–300. *2 figs.* 1922.—The temperatures studied were + 6°, + 11°, + 16°, and +26°C. A complete analysis of the wines and of the CO_2 evolution is given. Fermentation takes place rapidly but incompletely at 20–26°, while at 15–20° it is slower but more complete. CO_2 tension has a profound influence on the path of the fermentation.—*A. Bonazzi.*

474. Némec, A. **Zur Kenntniss der Glycerophosphatase der Pflanzensamen.** [**Glycerophosphatase of seeds.**] Biochem. Zeitschr. **137**: 570–575. *6 fig.* 1923.—Experiments with yellow mustard showed that cleavage of glycerophosphate decreased relatively with an increase in the concentration of enzyme. The yield of phosphoric acid was an exponential function of the original glycerophosphate concentration. The formation of glycerine as an end product increased the enzyme activity, probably as a result of greater solubility of the enzyme in the presence of glycerine. The maximum enzyme activity occurred at 35°C. Complete inactivation occurred at 70°C.—*H. D. Hooker, Jr.*

475. Oparin, A. **Einfluss des Sauerstoffs auf die Fermentbildung in keimenden Weizensamen.** [**The action of oxygen on enzyme formation in germinating wheat.**] Biochem. Zeitschr. **134**: 190–193. *2 fig.* 1922.—Increase of the partial pressure of O_2 had no effect on enzyme formation except on oxygenase production, which was decreased markedly in pure O_2. Substitution of an inert gas for O_2 led to a decreased enzyme production during all stages of germination except in the case of oxygenase. Free O_2 is considered essential for enzyme production.—*H. D. Hooker, Jr.*

476. Otto, Hermann. **Untersuchungen über die Auflösung von Zellulosen und Zellwänden durch Pilze.** [**Researches on the solution of cellulose and cell walls by fungi.**] Beitr. Allg. Bot. **1**: 190–260. *Pl. 1, fig. 1–12.* 1918.—Fungi of several different genera (exclusive of the wood-destroying fungi) were used in these experiments and cellulose of many types, both of plant and animal origin, as well as cellulose chemically treated to form hydrat-, hydro- and oxy-cellulose were supplied to the cultures. A number of the humus fungi (*Stemphylium, Mycogone, Botrytis, Cladosporium, Penicillium I & II*) were found to possess the ability to dissolve cellulose of the general character of the true celluloses. Cutinized and suberized cell membrane lamellae were resistant to the attack of all the fungi tried and so form a protection against entrance of fungus hyphae into the leaves and stems of higher plants. Lignified membranes may have part of their incrustation removed but the remaining portion protects the cellulose from the dissolving action of the enzyme cellulose secreted by the fungi. The cell walls were not dissolved by a uniform decomposition, as with homogeneous amorphous substances; they 1st showed certain fibrillae not normally visible, and finally these were dissolved, as well as the cellulose material binding them together. None of the Phycomycetes were able to dissolve true cellulose. Many higher fungi occurring on decaying plants are not normally capable of dissolving cellulose.—*Orton L. Clark.*

477. Paris, G. **La fase aldeidica della fermentazione alcolica.** [**The aldehydic phase of alcoholic fermentation.**] Staz. Sper. Agrar. Ital. **55**: 389–406. 1922.—Acetaldehyde was not obtained from alcoholic fermentation of saccharose by yeast even in presence of an excess of $NaHCO_3$ when 43 per cent of the theoretical alcohol yield was obtained. On adding 8 gm. of $NaHO.SO_2$, as much as 7.08 per cent of the invert sugar as acetaldehyde was obtained. Thus the author shows that the aldehyde is not formed through the action of a strongly alkaline solution on the sugar, but only through the action of the yeast itself. Pyruvic acid was experimentally fermented by yeast, yielding in presence of $NaHO \cdot SO_2$ as much as 33.93 per cent of the theoretical acetaldehyde, while with no addition only 12–13 per cent was formed. The author inclines to believe that the report of finding pyruvic acid in the presence of $CaCO_3$ during fermentation (Fernbach and Schoen) is erroneous, since he failed to obtain this. Paris used various methods for identifying the acetaldehyde; the isolation of the *p*-nitrophenyl-

hydrazone and the elementary composition of the salt obtained served as final proof. A low yeast was used throughout.—*A. Bonazzi.*

478. Pincussen, L. **Fermente und Licht. I. Diastase I.** [Enzymes and light. Diastase.] Biochem. Zeitschr. 134: 459–469. 1923.—The action of light from a quartz lamp on malt diastase was found to depend on concentration, on accompanying compounds, and on reaction. The greatest injury occurred at the optimum reaction for enzyme activity.—*H. D. Hooker, Jr.*

479. Pincussen, L., und N. Katô. **Fermente und Licht. II. Urease. I.** [Enzymes and light. Urease.] Biochem. Zeitschr. 134: 470–475. 1923.—Urease extracted from soy-bean meal with petroleum ether was exposed to radiation from a mercury quartz lamp. Injury depended on the hydrogen ion concentration and was greatest at the pH most favorable for the activity of the enzyme. Addition of urea delayed injury.—*H. D. Hooker, Jr.*

480. Revoltella, G. **Über eine Vereinfachung in der Herstellung eines Urease trockenferments, dessen Wirksamkeit und Eigenschaften.** [A simplified method for preparing dried urease; its activity and properties.] Biochem. Zeitschr. 134: 336–348. *4 fig.* 1922.—Urease was prepared from soy-bean meal by soaking it 5–6 hours in water. The extract was filtered and the protein precipitated with alcohol. The precipitate was dried, mixed with lactose, dried again, and more lactose added. This mixture was found to be as active as other preparations and was practically unaffected by room temperatures and light.—*H. D. Hooker, Jr.*

481. Rossi, G. **Ottavo contributo allo studio della macerazione della canapa.** [Eighth contribution to the study of hemp retting.] Ann. R. Scuola Super. Agric. Portici II, 17: 1–20. *Fig. 1–14.* 1922.—This paper deals with a variety of somewhat related topics. In the 1st place it elaborates certain successes with the industrial application of the author's method of hemp retting by means of pure cultures of *B. comesii* and other pectic ferments. In addition, the questions of quantity of air and of continuous vs. intermittent air currents is discussed. 2–3 liters of air for every cubic meter of water, per minute, is considered the proper practical speed of aeration in the retting tanks. The current need not be continuous since an aeration period of 10 hours out of every 24 is quite sufficient for optimum results. The use of ⅓ of the old water in the recharging of the tanks together with the new pure culture inoculation, proves neither an advantage nor a disadvantage. Three chapters are given to the study of the questions of variation and constancy of characters in a bacterial species. Stock cultures of *B. Comesii* and others in the author's collection (*B. bulgaricus* among them) are here cited as examples of periodic variability. The cultures which have been obtained by monocytogenetic methods are far from fixed (morphologically as well as physiologically). The paper as a whole deals considerably with fundamental questions of biology.—*A. Bonazzi.*

METABOLISM (RESPIRATION, AERATION)

482. Lipman, J. G. **Recent investigations on the oxidation of sulphur by microörganisms.** Indust. and Eng. Chem. 15: 405–406. 1923.—A brief discussion of some investigations on the microörganism *Thiobacillus thiooxidans.—Henry Schmitz.*

483. Rona, P., and K. Grassheim. **Studien zur Zellatmung. I. Beiträge zur Atmung der Hefezellen.** [Respiration of yeast cells.] Biochem. Zeitschr. 134: 146–162. *22 fig.* 1922. —The optimum reaction for the respiration of *Torula pulcherrima* was pH 4.5–6.6. The rate of respiration was high in cultures 2–7 days old, and diminished thereafter until after 14 days it ceased. In the presence of phosphate buffers the consumption of oxygen was 30 per cent less than in the presence of acetate buffers. A ⅓ molar concentration of phosphate buffer mixture was a most favorable concentration of phosphates for respiration.—*H. D. Hooker, Jr.*

ORGANISM AS A WHOLE

484. Anonymous. **Chemical characteristics of Australian trees.** Nature 111: 649–650. 1923.—This article refers to the work of H. G. Smith and R. T. Baker as reported in an address to the Chemical section at the Wellington meeting of the Australian Association for the

Advancement of Science in January. The genus *Eucalyptus* apparently originated in what is at present the western and northwestern portions of Australia, and as it spread eastward and experienced varying degrees of soil and climate the conditions demanded by these conditions were met by the responding characteristics of the genus. Nearly 200 species have been studied and about 40 chemical constituents isolated, including 11 alcohols, 9 aldehydes, 2 phenols, 7 esters, 5 terpenes, 1 ketone, 1 sesquiterpene, 1 paraffin, and cymene and cineol. The 2 main factors controlling the chemical sequence are: (1) the same species under natural conditions has comparatively constant properties; (2) each constituent follows the sequence of species in increasing amount until a maximum is reached in one or more of them. The function of small amounts of manganese present, though unknown, is regarded as essential.—*O. A. Stevens.*

485. Blum, Lucienne. **Modification des végétaux soumis à la culture en serre. [Modifications of plants under cultivation in the greenhouse.]** Compt. Rend. Acad. Sci. Paris 176: 1085–1087. 1923.—Plants growing in the open are compared with those growing in greenhouses. The stem of *Veronica officinalis*, the petiole of *Sanicula europaea*, and the corolla of *Viola canina* were examined in both summer and winter. Differences were found in the structure of the epidermis, sub-epidermal layer, cortex, pericycle, phloem, parenchyma, wood, and pith.—*C. H. Farr.*

486. Councilman, W. T. **The root system of Epigaea repens and its relation to the fungi of the humus.** Proc. Nation. Acad. Sci. [U. S. A.] 9: 279–285. *4 fig.* 1923.—This ericaceous plant thrives in soils covered with forest "humus," in partial shade. The short underground stem, the creeping branches, and the coarse abruptly terminating primary roots all give off fine roots which end in many capillary terminal roots, often only 30–40 μ in diameter. A brown fungous mycelium is always present on the roots, especially the smaller ones. Some hyphae penetrate between the epidermal cells of the root and may extend deeper. The fungous hyphae produce haustoria which penetrate the cells of the root; in many cells the invading hyphae divide rapidly to form colorless, glomerulus-like masses. About blooming time the glomerular masses are usually much disorganized; perhaps the roots are able to utilize them as food supplies. The fungus does not form true mycorrhiza, lacking out-streaming hyphae. The "humus" may benefit Epigaea by furnishing favorable conditions for the growth of the fungus.—*Howard B. Frost.*

487. Lantzsch, Kurt. **Actinomyces oligocarbophilus (Bacillus oligocarbophilus Beij.), sein Formwechsel und seine Physiologie. [A. oligocarbophilus (B. oligocarbophilus Beij.). Variation in form and physiology.]** Centralbl. Bakt. II Abt. 57: 309–319. *Pl. 1 fig. 1–3.* 1922. —*Bacillus oligocarbophilus* was found to have 2 forms, a coccus or short rod form and an actinomyces form. The development of the 2 should be taken as an indication of their reaction to the source of carbon. In the actinomyces form the organism assimilates CO; in the coccus or short-rod form it assimilates the higher members of the aliphatic hydrocarbon series. Benzol and xylol are not assimilated. H_2 is not oxidized either in pure culture or in symbiosis with other bacteria. Both forms are acid fast, gram positive, and form volutin.—*Anthony Berg.*

488. Lubimenko, V., et O. Sžegloff. **Sur l'adaptation des plantes à la durée de la période claire de la journée. [The adaptation of plants to the duration of the light portion of the day.]** Compt. Rend. Acad. Sci. Paris 176: 1915–1918. 1923.—From August 1st to September 20th experiments were performed on *Phaseolus vulgaris*, *Hordeum vulgare*, and *Sinapis alba* in lengthening the night. Five lengths of night were tried; the controls had 10 hours of darkness, the others 14, 16, 18, and 20 hours respectively. Prolonging darkness caused shorter stems. The maximum number of leaves and the maximum leaf surface were attained with 14–16 hours of night. The beans bloomed under all illuminations, the maximum being with the 14 hour, the minimum with the 20 hour night. Barley and mustard bloomed only in the controls. Barley and mustard yielded the maximum dry weight in 10 hours of night, beans with 14 hours of night. These results indicate that the bean is a short-day plant, the other 2 are long-day plants. It was also found that in all 3 plants the quantity of chlorophyll was markedly less in the 20 hour night, but the efficiency of the chlorophyll seemed higher. There is some evidence that light retards the chemical reactions of the leaf, other than photosynthesis, and thus permits an accumulation of dry matter in the leaf.—*C. H. Farr.*

489. Perotti, R., and J. Cortini-Comanducci. Normale presenza di batteri nelle radici di numerose fanerogame. [Normal presence of bacteria in the roots of numerous phanerogams.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. Nat. 31²: 484–487. 1922.—Examinations and cultures were made of roots of 32 different species of plants which appeared normal and healthy, and bacteria representing 12 different families are reported to have been found in about ¾ of them.—*F. M. Blodgett.*

490. Reed, Guilford. The species concept from the point of view of a physiologist and bacteriologist. Amer. Jour. Bot. 10: 234–238. 1923.—The author believes that, from a physiological point of view, taxonomic criteria based on differences between organisms in the chemical constitution of their protoplasm are more fundamental than those based on structural differentiation. He cites the classification of bacteria by the methods of immunology; the various blood reactions of the higher animals; and the chemical differentiation between homologous proteins, especially the hemoglobins, and between the various starches, enzymes, and other substances. Species continuity and individual development depend upon the constancy of the specific synthetic reactions of the organism. Relationships based on chemical specificity in general agree closely with those based on structural features.—*E. W. Sinnott.*

GROWTH, DEVELOPMENT, REPRODUCTION

491. Leonian, Leon H. The physiology of perithecial and pycnidial formation in Valsa leucostoma. Phytopathology 13: 257–272. 1923.—The relation of the concentration of nutrients and of the presence or absence of various organic and inorganic nutrients to the production of pycnidia and of perithecia by *Valsa leucostoma* was studied. In this study a standard solution consisting of KH_2PO_4 1.2 gm., $MgSO_4$ 0.6 gm., peptone 0.6 gm., maltose 6.25 gm., malt extract 6.25 gm., and distilled water 1000 cc. was used. The fungus was grown upon pads of filter paper placed in a glass capsule and wet with the nutrient solution to be tested. By using this method, the filter paper with the fungous mycelium could be lifted, washed with sterile distilled water, and transferred from one solution to another at any stage of development. Both pycnidia and perithecia were produced when the standard solution was diluted to contain only 0.37 per cent of solid nutrients; and they were produced in greatly increased number, but approximately in the same proportions in respect to concentration, when the concentration was increased to 24 per cent. Both pycnidia and perithecia were suppressed when the standard solution minus malt extract was used, and also when malt extract and maltose were replaced with ammonium nitrate and cane sugar. In general, nitrates hindered the production of perithecia.—*B. B. Higgins.*

492. Molliard, Marin. Sur le déterminisme de la formation des conidies chez le Sterigmatocystis nigra. [On determining the formation of conidia by Sterigmatocystis nigra.] Compt. Rend. Acad. Sci. Paris 176: 1857–1860. 1923.—This fungus was grown on various culture media, the compositions of which are given, and the effect of the various salts upon the production of conidia noted. It is found that 2 conditions must be present simultaneously in the media in order to have conidia formed, viz.,—a deficiency of phosphorus, and an excess of potassium, in proportion to the other nutritive elements.—*C. H. Farr.*

493. Rehfous, L. Sur la périodicité des bourgeons non protégés. [The periodicity of unprotected buds.] Bull. Soc. Bot. Genève 13: 10. 1921.—Preliminary experiments on the buds of *Pterocarya caucasica* and *Viburnum lantana*, in which continuous light from the Osram lamp, violet rays, and variations in temperature were used, gave results similar to those of previous experiments [See Bot. Absts. 11, Entry 3093].—*W. H. Emig.*

494. Schroeder, H. Untersuchungen an Geophilen. I. Über Paris quadrifolius L. [Investigations on rhizomes. I. Paris quadrifolius.] Ber. Deutsch. Bot. Ges. 39: 88–93. 1921.—This preliminary paper deals with a few measurements of the leaf buds of Paris. It was found that the leaf-sheaths and the enclosed terminal shoot are somewhat bent at the base so that their tips point upward in the fall. The terminal bud of the monopodial rhizome becomes stunted and in the beginning of November the growing point buried among the scales is just a few mm. in height and remains in this position during the winter, so that no growth takes place during the winter months In the warm season of the year the growth of the shoot

takes place 1st, then the growth of the rhizome, and later the leaf-shoot. Rhizomes of Paris were kept growing submerged in Knop's solution for weeks. Some of these plants were supplied with diffused light, others were kept in the dark. Those in the light grew well and the newly developed parts of the rhizome grew downwards; those plants kept in the dark became etiolated, grew very slowly, and the tips curved upwards. The behavior of rhizomes planted at different depths was observed. It was found that, as a result of transversegeotropism, the rhizomes orient themselves horizontally at all depths and only the influence of the leaf-shoot at abnormal depths is affected by the varied direction of growth.—*L. J. Pessin.*

495. Summers, F. **Factors governing fruit bud formation VI. The stimulation of bud growth in cuttings by inorganic and organic solutions.** Jour. Bath and Western and Southern Counties Soc. 17: 145–149. 1923.—The author injected cut apple shoots with 5 per cent solutions of saccharose, dextrose, and levulose by placing the shoots in the solution in a closed vessel and exhausting the vessel with a filter pump. Development of buds was accelerated in all cases, most in saccharose, and the buds nearest the lower end of the twig showed the earliest response. Repetition of the injection after a week increased the stimulatory effect. 0.5 per cent $KMnO_4$ solution produced no stimulation even when twice injected; 0.5 per cent H_3PO_4 gave a slight immediate stimulation and showed better results than the sugars at the end of 40 days. Injection of attached shoots with 1 per cent diastase by means of a hypodermic syringe resulted in development of shoots from buds nearest the points of injection, the growth beginning while neighboring buds were still dormant.—*Joseph S. Caldwell.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

496. Bannert, Otto. **Über den Geotropismus einiger Infloreszensachsen und Blütenstiele. [On the geotropic responses of certain inflorescence axes and flower stalks.]** Beitr. Allg. Bot. 1: 1–44. *Fig. 1–4.* 1918.—Experiments carried out on the clinostat showed that the curvatures of the inflorescence axis of *Mimosa, Pelargonium*, and the flower stalks of *Convallaria, Fuschia, Abutilon, Funkia, Ipomea, Althea, Aloe, Chlorophytum*, and *Amaryllis* are caused by gravity. Counter-balancing the weight of the young buds and inflorescences does not prevent the downward movement due to gravity (not, as Wiesner held, due to "inherited epinasty)". Anatomical studies showed the presence of statolith starch in inflorescence axes and flower stalks.—*Orton L. Clark.*

497. Prankerd, T. L. **On the irritability of the fronds of Asplenium bulbiferum, with especial reference to graviperception.** Proc. Roy. Soc. London B 93: 143–152. 1922.—Neglecting minor growth movements, epinasty and geotropism begin with growth of frond, response to light being evident somewhat later. Toward the end of the grand period of growth, geotropism is the 1st characteristic to be lost, followed later by epinasty and last by phototropism. Latent and reaction periods seem longer for gravity than in angiosperms. Recovery of position is secured by oscillation. A definite statolith apparatus was found in fronds, the period of its prevalence coinciding with that of graviperception.—*P. B. Sears.*

498. Zollikofer, Clara. **Über das geotropische Verhalten entstärkter Keimstengel und den Abbau der Stärke in Gramineen-Koleoptilen. [On the geotropic behavior of seedling stems freed of starch and the breaking down of starch in the coleoptiles of grasses.]** Beitr. Allg. Bot. 1: 399–448. 1918.—Hypocotyls of *Tagetes erecta, Dimorphotheca amantiaca*, and a few other Compositae which contain only statolith starch may be entirely freed from starch by placing them in the dark for several days after a preliminary exposure to diffuse daylight for 1–4 days from the time of germination. Plants so freed from starch show growth and a reaction to phototropic stimuli but do not respond to a geotropic stimulus. New formation of statolith starch on exposure to light or culture in grape sugar solution results in immediate restoration of geotropic sensitivity and reaction after stimulation. In the coleoptiles of the grasses *Sorghum* and *Hordeum* the breaking through of the 1st leaves is paralleled by the loss of geotropic sensibility in the tip of the coleoptile which is accompanied by the breaking down of statolith starch. In Sorghum seedlings cultivated in the dark the statolith starch remains as such, but in Hordeum it is broken down much later and less completely than in seedlings grown in the light. This condition helps to explain the longer period of geotropic sensibility of seedlings grown in the dark. The resistance of statolith starch stands in close relation to etiolation, increasing with the latter.—*Orton L. Clark.*

GERMINATION, RENEWAL OF ACTIVITY

499. Boas, F., und F. Merkenschlager. **Spezifische Zuckerwirkung bei Keimversuchen.** [The specific action of sugars on germination.] Biochem. Zeitschr. 137: 300–311. 2 *fig.* 1923.—Galactose counteracted the retarding action of calcium ions on germination of *Lupinus luteus* seeds and was more effective than arabinose or sucrose. The lower the fat content of the seeds, the greater the susceptibility to calcium. Digitonin stimulated germination.—*H. D. Hooker, Jr.*

500. Guillaumin, A. **Le vide comme moyen de prolonger la faculté germinative des graines.** [A vacuum as a means of prolonging the germinative power of seeds.] Compt. Rend. Acad. Sci. Paris 176: 1737–1739. 1923.—Seeds of wheat, radish, and lettuce are found to retain their germinative power long in a vacuum, without previous artificial dessication, than in the air. The time of preservation, *in vacuo*, is not given.—*C. H. Farr.*

501. Houdas, J. **Sur la conservation des graines dans les gaz inertes.** [On the preservation in viable condition of seeds in inert gases.] Compt. Rend. Acad. Sci. Paris 176: 1407–1409. 1923.—Experiments were performed in keeping seeds of *Gerbera Jamesoni* and its hybrids, which seeds do not keep well in air, in hydrogen and carbonic anhydride. Seeds have been kept in these gases since 1910 and the viability tested every year. It has continued practically constant at from 86 to 100 per cent. The hydrogen gives slightly better results than the carbonic anhydride.—*C. H. Farr.*

RADIANT ENERGY RELATIONS

502. Brooks, C. F. **The freezing of peach buds.** [Rev. of: Johnston, Earl S. **The freezing of peach buds.** Monthly Weather Rev. 49: 231. 1921 (see Bot. Absts. 12, Entry 504).] Bull. Amer. Meteorol. Soc. 2: 83–84. 1921.

503. De Fazi, Romolo e Remo. **Azione dei raggi ultravioletti sul Saccharomyces cerevisiae.** [Action of ultraviolet rays on Saccharomyces cerevisiae.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. Nat. 31^2: 31–32. 1922.—Yeast exposed to the action of a quartz mercury vapor lamp of 1200 candle-power for 12 hours was compared on a large scale with yeast not so treated, by inoculating 100 hectoliters of must with each. The treated yeast caused more rapid decrease in density with less production of acid.—*F. M. Blodgett.*

504. Johnston, Earl S. **The freezing of peach buds.** Monthly Weather Rev. 49: 231. 1921.—The freezing point of sap in peach buds was observed to be 20.3°F. in winter and 24.6°F. in spring. Dry buds froze at a lower temperature than wet ones. [See also Bot. Absts. 12, Entry 502.] *Author's Abstract.*

505. Young, E. G. **The coagulation of protein by sunlight.** Proc. Roy. Soc. London B 93: 235–248. 1922.—Recrystallized serum and ovalbumens become sensitive to the visible rays of the solar spectrum, the reaction having many of the characteristics of heat coagulation. The reaction consists of a chemical change (marked by increased viscosity and rotation, decreased surface tension) followed by flocculation. The velocity of the chemical change is hastened by acids or bases, the solution in either case moving toward the isoelectric point. Various accelerators are discussed.—*P. B. Sears.*

TOXIC AGENTS

506. Hengl, Franz. **Versuche über künstliche Rauchschäden mit schwefeliger Säure.** [Experiments with artificial injury by sulphur dioxide.] Wiener Landw. Zeitg. 73: 120. 1923.—In the experiments beans, peas, sugar beets and sugar cane were subjected to a concentration of SO_2 (in air) of 1 to 200,000, and barley was exposed to a concentration of 1 to 100,000. Exposure was made for 1 hour daily for 15–90 days. Diminution of yield resulted with beans but not with peas. The maturity of barley was delayed; the sugar content of sugar beets was depressed; but the vigor of sugar cane sprouts was not impaired. A study will be made of the effect of smoke injury on the 2nd generation.—*F. Weiss.*

507. Joachimoglu, G. **Über den Einfluss der Wasserstoffionenkonzentrationen auf die antiseptische Wirkung des Sublimats.** [The effect of hydrogen ion concentration on the antiseptic action of sublimate.] Biochem. Zeitschr. 134: 489–492. 1923.—The antiseptic power

of a 1:600,000 $HgCl_2$ solution was greatest at pH 5–6.6. At pH 7.8–10.1 very little disinfecting power was evident.—*H. D. Hooker, Jr.*

508. Jungmann, W. **Physiologisch-anatomische Untersuchungen über die Einwirkung von Blausäure auf Pflanzen.** [Physiological-anatomical investigations of the action of hydrocyanic acid on plants.] Ber. Deutsch. Bot. Ges. 39: 84–87. 1921.—A large number of plants including leaves and branches of *Griselinia littoralis*, *Prunus cerasus*, *Prunus laurocerasus*, *Ilex aquifolium*, *Hedera helix*, *Syringa vulgaris*, and certain herbaceous plants were exposed to HCN gas of different known concentrations ranging from 0.1 to 8.1 volume per cent. The plants or parts were exposed to the gas about 10 minutes, and the time required for a browning or discoloration was observed. In the lesser concentrations no poisonous effects could be detected, but in the stronger concentrations all the plants except Griselinia, which was resistant, died within 14 days. The 1st appreciable damage occurred at concentrations of 1.2 volume per cent, and complete destruction occurred at a concentration of 2.4. A certain time period is required for the gas to penetrate the tissue. When Griselinia was exposed to 0.0025 volume per cent HCN at 15–20° for 10 minutes, brown spots appeared on the 8th day; with a 30-minute exposure the damage occurred on the 6th day; with a 60-minute exposure, as early as the 4th day. Plants with thin cuticle were damaged more quickly than those with thicker cuticle. Plants which naturally contain HCN were especially sensitive to HCN influence from the outside. Parts of plants behave like whole plants. Even 0.00015 volume per cent checked growth in *Pisum sativum* seedlings, but Syringa grew when exposed 60 minutes to 0.3 volume per cent. Sunlight augments the damage, probably on account of its heat effect. Diffuse light is no more harmful than darkness. The gas enters principally through the stomata, but penetrates slowly when the stomata are closed or when pressure is applied. Assimilation and respiration are checked or deranged. Protoplasmic and nastic movements were stopped even though the plant was not damaged. In practice the stronger concentrations of the gas should be used with short exposures rather than weaker doses for longer exposures. Sunlight and high temperature should be avoided during exposure of the plants to the gas. Plants with young leaves should be treated very cautiously.—*C. M. Conrad.*

509. Piskernik, Angela. **Über die Einwirkung fluoreszierender Farbstoffe auf die Keimung der Samen.** [The effects of fluorescent dyes on the germination of seeds.] Sitzungsber. Akad. Wiss. Wien. [Math.-Nat. Kl.] I Abt. 130: 189–214. *4 fig.* 1921 [1923].—Seeds of garden plants, such as pea, broad bean, lentil, mustard, cress, wheat, beet, and others, were immersed in aqueous solutions of different concentrations of fluorescent dyes—in particular, eosin, safranin, magdala-red, erythrosin, methylene-blue, rhodamin, fluorescein, and diazoresorcin—for 24 hours, both in light and in darkness, and the effects of the treatment on germination observed. Various forms of injury, depending on the kind and concentration of the dye and the light intensity, were noted. These were, in order of increasing severity, failure of the root to react tropically, absence of root hairs, shortening of the stem, distortion of the root, flecking of the leaves, and browning and death of the root tip. As controls, seeds were treated with pure water and with non-fluorescent dyes such as fuchsin and anilin-blue. All the dyes exhibited a direct toxic effect when used in concentrations of 1:1000 or higher, both in darkness and in light; but the fluorescent dyes exhibited a distinct "phytodynamic" effect in concentrations as low as 1:10,000 and 1:100,000, and this effect, relatively slight in darkness, was increasingly severe as the light intensity during the treatment was greater. Noack's explanation, that the fluorescent dyes act as light catalysts which transfer in reversible manner atmospheric oxygen to the respiratory chromogens, is accepted. Chlorophyll acts as a protective agent against the injurious effect of fluorescent dyes. The facts that the maximum effect of these dyes occurs in the spectral region of maximum absorption of light, and that the mildest form of injury consists in the loss of geotropic and hydrotropic response, are interpreted to indicate a direct effect on the protoplasm. The more severe injury produced by higher concentrations seems to consist of an effect exerted on the cell wall or plasma membrane.—*F. Weiss.*

510. Schumacher, J. **Über oligodynamische Metallwirkung.** [The oligodynamic action of metals.] Biochem. Zeitschr. 134: 398–404. 1922.—Water rendered oligodynamic by contact with silver was found to contain free metallic ions by testing with leuco-methylene blue.

This test was given by free metal ions but not by complex ions. Free metallic ions are thought to stimulate oxidation in living cells, provided they are present in small amounts, and thus to favor growth and metabolism.—*H. D. Hooker, Jr.*

511. Stoklasa, J. **Über den Einfluss des Schwefeldioxyds auf die Atmung der Phanerogamen. [The effect of sulphur dioxide on phanerogamic respiration.]** Biochem. Zeitschr. **136**: 306–326. *3 fig.* 1923.—Under exposure to various concentrations of SO_2 fir shoots showed that respiration was affected much less than photosynthesis. At weaker concentrations (0.075 volumes per cent) the chloroplasts became swollen. At higher concentrations (0.5–3.5 volumes per cent) the chlorophyll was decomposed and oil drops exuded from the chloroplasts. Leaves absorbed more sulphur dioxide than stems and branches. The respiratory quotient was decreased 38 per cent at 3.5 volumes per cent, and less at lower concentrations.—*H. D. Hooker, Jr.*

MISCELLANEOUS

512. Guillaumin, Ch.-O. **Sur un chromoscope destiné à la mesure de la concentration en ions H des liquides par les indicateurs colorants. [A chromoscope for H-ion concentration determinations with colored indicators.]** Bull. Soc. Chim. Biol. **5**: 153–154. *1 fig.* 1923.—An improved device is described which makes the use of a dark room unnecessary and permits the use of either direct or reflected light.—*Joseph S. Caldwell.*

513. Keller, R. **Neue Dielektrizitätskonstanten. [New dielectric constants.]** Biochem. Zeitschr. **136**: 163–168. 1923.—Among other measurements the dielectric constants of yeast and green leaves are given.—*H. D. Hooker, Jr.*

514. Kopaczewski, W. **Un Viscodensimètre. [A viscodensimeter.]** Bull. Soc. Chim. Biol. **5**: 316–324. *2 fig.* 1923.—A number of sources of error inherent in other instruments are eliminated in this instrument. Measurements may be made at any desired temperature, and without previous determination of the density of the liquid, with a degree of precision unattainable with the apparatus of Ostwald.—*Joseph S. Caldwell.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 1, 10, 11, 12, 14, 25, 35, 36, 48, 53, 56, 58, 59, 100, 410, 468, 482, 622)

515. Amet, A. V. **Types and tests of soils.** Better Fruit 17^{12}: 7–8, 34. 1923.—This popular description of the common types of soils includes detailed gross procedure of testing soil for humus, bacterial activity, acidity, nitrates, lime, etc.—*A. E. Murneek.*

516. Blair, A. W., and H. C. McLean. **The chemical composition of the soils of the Belvidere area in New Jersey.** New Jersey Agric. Exp. Sta. Bull. 392. *16 p., 1 fig.* 1922.

517. Christensen, Harold R. **Undersogelser vedrorende nogle nyere Fremgangsmaader til Bestemmelse af Jordens Reaktion og Kalktrang. [Investigations of new methods for determining the reaction and lime requirements of soils.]** Tidsskr. Planteavl **28**: 733–768. 1922.—The method now used in Denmark to determine the lime requirements of soils is based on the results of the author's investigations, announced in 1906. The H-ion concentration method and the litmus test are discussed. The greatest drawbacks to litmus are the slight buffer action and the lack of sensitiveness to small changes. Litmus-neutral soils have always been subjected to the Azotobacter test. A wide range of H-ion concentrations is shown, from pH 4.5 to 7.8. The new American indicators (brom-phenol-blue, brom-cresol-purple, brom-thymol-blue and phenol-red) were compared with litmus and Azotobacter in 5,000 soil tests. None of these indicators alone can replace litmus.—Tests of 3,200 soil samples were made to ascertain the relation between Azotobacter development and the reaction figure for the soil. A table shows the relation between Hasenbäumer's and Comber's methods and soil reaction and Azotobacter growth. The 2 methods are of interest as supplementary tests in investigating the reaction and lime requirements of the soil, both tests being used when the Azotobacter test becomes very difficult. Printed guides sent to farmers state that a reaction figure below

5.7 indicates great need of lime; one of 5.7–6.0 indicates need of lime; one above 6.8 indicates lime unnecessary; 6.0–6.8 has no definite indication regarding lime.—*Albert A. Hansen.*

518. Delafon-Routier. **Le rôle du soufre dans la culture. [The rôle of sulphur in crop production.]** Rev. Hort. **94:** 257–258. 1922.

519. Fischer, Walther. **Die Gefahr zunehmender Bodenversäuerung auf leichten Böden. [The danger of increasing soil acidity on light soils.]** Mitteil. Deutsch. Landw. Ges. **38:** 436–437. 1923.—A case is reported of diseased areas in oats found to be due to the acidity of the soil.—*A. J. Pieters.*

520. Mitscherlich, E. A., und H. Wagner (with collaboration of F. Duhring, S. V. Saucken and C. Böhm). **Ein Beitrag zur Kali- und Magnesia- Düngung. [Contribution to potassium and magnesium fertilization.]** Landw. Jahrb. **58:** 645–653. 1923.—The greater the amount of available nutrient in the soil the greater will be the percentage of this nutrient in the plant. The assimilation of a certain nutrient and the increase in crop yield is affected not only by the concentration of the particular nutrient but also by the presence of other substances. The presence of sodium, for example, produced a threefold increase of crop yield with the same application of potassium. The application of magnesium results in increased crop yields only in exceptional cases.—*S. A. Waksman.*

521. Noyes, H. A., J. H. Martsolf, and H. T. King. **Cultivation and nitrogen fertilization.** Jour. Indust. and Eng. Chem. **14:** 299–302. 1922.—Cultivation and the presence of inorganic matter favor nitrogen formation in soils. Early application of nitrate of soda and proper cultivation often give considerable quantities of nitrate in vineyards at the time 2nd applications are made. An application of available nitrogen at plowing time appears sufficient for properly cultivated vineyards.—*Henry Schmitz.*

522. Reitmar, O. **Neue Düngesysteme und neue Phosphatdünger. [New systems of fertilization and new phosphate fertilizers.]** Wiener Landw. Zeitg. **73:** 26. 1923.—Announcement is made of the production of a new active phosphate fertilizer from raw rock phosphate.—*F. Weiss.*

523. Simon, L. J. **Détermination du carbone dans la terre végétable. [The determination of carbon in humus.]** Compt. Rend. Acad. Sci. Paris **176:** 1409–1411. 1923.—The method employed is oxidation with a solution containing sulphuric acid and silver bichromate in the ratio of approximately 3 to 1.—*C. H. Farr.*

524. Sola, I. **Sulle torbe piemontesi. [The peats of Piedmont (Italy).]** Staz. Sper. Agrar. Ital. **55:** 29–33. 1922.—This is a chemical study of the peats from various parts of the province of Piedmont.—*A. Bonazzi.*

525. Veitch, F. P. **Wool scouring for fertilizer purposes.** Jour. Indust. and Eng. Chem. **14:** 434. 1922.

526. Waggaman, Wm. H. **The economic use of phosphate deposits.** Jour. Amer. Soc. Agron. **15:** 152–158. 1923.—The pyrolytic process of producing phosphoric acid is discussed. Proof of the commercial feasibility of this process has not as yet been secured. Low grade and run-of-mine phosphates can be used. Elimination of the use of H_2SO_4 and production of a concentrated product are some of the adventages of the method.—*F. M. Schertz.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 29, 111, 257, 263, 374, 417, 435, 484, 490, 612)

GENERAL

527. Anonymous. [Rev. of: Babington, C. C. **Manual of British botany: containing the flowering plants and ferns arranged according to the natural orders.** *10th ed.*, with amended nomenclature and an appendix. Edited by A. J. Wilmott. *lvi + 612 p.* Guerney and Jackson: London, 1922.] Nature **111:** 251. 1923.

528. Barnhart, J. H. [Rev. of: Abrams, Le Roy. **An illustrated flora of the Pacific States.** Vol. I. Ophioglossaceae to Aristolochiaceae. *xi + 557 p., 1299 fig.* Stanford Uni-

versity Press, 1923.] Torreya 23: 69–71. 1923.—The work is to be completed in 3 volumes. No section of the U. S. A. except the northeastern states has heretofore possessed a descriptive illustrated flora. The book is closely patterned after Britton & Brown's Illustrated Flora, but decapitalizes all specific names, and uses the metric system. In an area about $\frac{1}{5}$ of that included by Britton and Brown, the number of species is more than $\frac{3}{4}$ as great. More than $\frac{3}{5}$ of the text has been contributed by specialists. It is hoped that in the remaining volumes the author will find more room for self-expression.—*J. C. Nelson.*

529. Bolus, Mrs. F., and R. Marloth. **Instructions for collecting and drying botanical specimens and for writing their accompanying tickets.** Bot. Surv. South Africa Mem. 4: 54–58. 1922.

530. Cheel, E. **Changing plant names.** Australian Nat. 5: 104–108. 1923.—Some reasons for such changes, with examples, are given.—*T. C. Frye.*

531. Marloth, R. **Notes on the proper use of the common names of plants.** Bot. Surv. South Africa Mem. 4: 66–68. 1922.

532. Menezes, Carlos A. de. **Uma antiga lista de plantas da Madeira. [An old list of Madeiran plants.]** Brotéria Sér. Bot. 20: 12–25. 1922.—James Cook, on his voyages to the southern hemisphere, stopped at Madeira in 1768, accompanied by Banks and Solander, and again in 1772, accompanied by J. R. and J. J. A. Forster. The plants collected on these occasions are at the British Museum and at Kiel. Only the Forsters published any list (Comm. Soc. Götting. 9: 46–74. 1787) and this did not specifically separate the Madeiran plants from those of the Atlantic islands. The author has brought together the 96 Madeiran species of the original list, keeping the original order and wording, but adding explanatory and critical notes to collate the statements with present day knowledge.—*E. B. Chamberlain.*

533. Sawer, E. R. **A review of the agricultural situation in Palestine.** Government Publication: Haifa, Palestine, 1923.—The appendices give much valuable information: The forest flora—a list of the Latin names of all the trees, shrubs, and sand-dune plants found in Palestine (XVII, p. 55); summary of experimental forest plantations, organized in 1921, 1922 (XIX, pp. 59–65); a list of trees and plants introduced for experimental trial (Latin and English) (XX, pp. 66–69); nurseries and plantations of the Agricultural Department of the Zionist Commission, including localities and numbers of trees (XXII, pp. 71–73).—*John E. Dinsmore.*

PTERIDOPHYTES

534. Alderwerelt van Rosenburgh, C. R. W. K. van. **Two new Malayan fern genera.** Bull. Jard. Bot. Buitenzorg III. 4: 317–319. *Pl. 14, 15.* 1922.—Two new genera, **Parasorus** with 1 species *P. undulatus*, and **Grammatopteris**, with 2 species and 1 variety, *G. Brooksii* var. *Beguinii*, and *G. pseudodrymoglossum*, are described and figured.—*Alfred Rehder.*

SPERMATOPHYTES

535. Alderwerelt van Rosenburgh, C. R. W. K. van. **New or noteworthy Malayan Araceae 2.** Bull. Jard. Bot. Buitenzorg III. 4: 163–229. *Pl. 2, 3, Fig. a–z.* 1922.—Besides notes on numerous critical or noteworthy species this paper contains the following new species, varieties and combinations: *Amorphophallus obovoideus, A. Cobra, A. incurvatus, Arisaema ramulosum, Holochlamys ornata, Homalomena cristata, H. oblanceolata, H. lucidula, H. incerta, H. pygmaea* (Hassk.) Engl. var. *purpurascens* (Schott), *H. sulcata* Engl. var. *subconcolor, H. refulgens, H. obscurifolia, H. pusilla, H. aeneifolia, H. asperifolia, H. Doctersii, H. polyandra, H. rupicola, H. silvatica, H. coccinea, H. triangularis, H. paliformis, H. habokoana, H. javanica* and var. *kangeanensis, H. discolor, H. bancana, H. Nieuwenhuisii, H. subemarginata, H. sagittifolia* Jungh. var. *sumatrana, Piptospatha angustifolia, Raphidophora ternatensis, R. octovulata, R. scaberula, R. jaculiformis, Schismatoglottis sylvestris* and var. *subcordata, S. puberulipes, S. grandiflora, S. monticola, S. belophylla, S. sagittifolia, S. diversicolor, S. kurimana, S. plurivenia, S. wahaiana, S. leptophylla, S. Ruttenii, S. pseudocalyptrata, S. calyptratoides, S. latifolia* Miq. var. *rubescens, S. Engleriana, S. maculata, S. ornata, S. Vanvuureni, S. sublaxiflora, Scindapsus roseus, S. splendidus, S. suffruticosus,* and *S. alpinus.*—*Alfred Rehder.*

536. Alderwerelt van Rosenburgh, C. R. W. K. van. **New or noteworthy Malayan Araceae 3.** Bull. Jard. Bot. Buitenzorg III. **4**: 320–347. *Pl. 16.* 1922.—The paper contains additional information on less known species and the following new species, varieties and combinations: *Aglaonema Nieuwenhuisii* Engl., *A. obovatum*, *A. oblanceolatum* and f. *maximum*, *A. brevivaginatum*, *A. emarginatum*, *A. latius*, *A. grande*, *A. subarborescens*, *A. elongatum*, *A. robustum*, *Epipremnopsis Zippeliana* (Engl.), *E. magnifica* (Engl.), *Holochlamys elliptica*, *Homalomena rubrovaginata* and var. *subpurpurea*, *H. lilacina*, *H. sebessiana*, *H. rosea*, *H. ensiformis*, *H. Miqueliana* Schott var. *truella*, *Pothos quinquevenosus*, *P. cuspidatus*, *P. ovatifolius* Engl. var. *simalurensis*, *Raphidophora parvifolia*, *R. pallidivenia*, *R. drepanophylla*, *R. oligosperma*, *R. obliquata*, *R. latifolia*, *Schismatoglottis Brooksii*, *S. parvifolia*, *S. potamophila*, *S. angustifolia*, *S. conversa*, *Scindapsus Beccarii* Engl. var. *lingganus*, and *S. altissimus*.—*Alfred Rehder.*

537. Becker, Wilh. **Violae Asiaticae et Australenses.** Beih. Bot. Centralbl. II Abt. **40**: 20–69. *Pl. 1–5, 69–118, 119–171.* 1923.—Group *Mirabiles* Nym. includes 3 species. Group *Rosulantes* Borbás is redescribed and the form of style is shown in the plates. The morphology, distribution, and phylogeny of this group are discussed and 19 species are recognized. *Viola Helleriana* is described as a new species, *V. Riviniana* Rchb. subsp. *neglecta* is a new subspecies, and *V. Fedtschenkoana* W. Bckr. var. *muzaffarabadensis* is a new variety. Group *Melanium* Ging. contains 14 species. These varieties are new: *V. Heldreichiana* Boiss. var. *alajensis*, *V. dacica* Borbás var. *palmata*, *V. dichroa* Boiss. & Huet var. *typica* and var. *microstipulata*. Group *Serpentes* W. Bckr. contains 12 species with one new variety, *V. serpens* Wall. var. *deltoidea*. Group *Diffusae* W. Bckr. has 3 species with one new variety, *V. diffusa* Ging. var. *glaberrima*. Group *Pinnatae* W. Bckr. contains 3 species. Five species, related to *V. Selkirkii* Pursh, are listed from Japan, and 46 species from various Asiatic regions are described.—*L. Pace.*

538. Blake, S. F. **Two new composites from Florida.** Bull. Torrey Bot. Club **50**: 203–205. *Pl. 9.* 1923.—*Lacinaria Ohlingerae* and *Flaveria pinetorum* are described as new species.—*P. A. Munz.*

539. Boye Peterson, Johs. **On a new species of Furcraea Vent. from Nicaragua.** Bot. Tidsskr. **37**: 305–311. *Pl. 4, 7 fig.* 1922.—In 1848 an agave-like plant was introduced into the Botanical Garden of Copenhagen by A. S. Ørsted. When the specimen flowered it was found that it belonged to *Furcraea*. The author gives a description of the species and names it *Furcraea stratiotes* n. sp. A short summary in Danish is submitted.—*A. L. Bakke.*

540. Brandegee, T. S. **A note on Penstemon Stephensi.** Bull. Torrey Bot. Club **50**: 215. 1923.—Objection is made to the reduction of *Penstemon Stephensi* Brandegee to varietal rank under *P. Clevelandi* Gray. [see Bot. Absts. 11, Entry 3227], as it is claimed that the latter is scarlet, while the former is purple-flowered.—*P. A. Munz.*

541. Britton, N. L. **An unrecorded weed in Bermuda.** Torreya **23**: 67–68. 1923.—*Sisymbrium erysimoides* Desf., a species of southern Europe, was collected by H. H. Whetzel in an onion-field in Paget, Bermuda, March 6, 1922, and by Miss M. Stevens in the spring of 1913. The species is briefly described, and the new combination *Norta erysimoides* (Desf.) Britton is proposed.—*J. C. Nelson.*

542. Campanile, G., e G. B. Traverso. **Materiali per la identificazione delle Cuscute italiane. Nota prima.** [**A first note upon observations on the identification of Italian dodders.**] Staz. Sper. Agrar. Ital. **56**: 5–25. *Fig. 1–7.* 1923.—The authors examine fresh specimens of dodder and establish the fact that, due to great variation, the only character of value in the classification is that of the length of the style. This character led the authors to establish 2 separate types in the species *Cuscuta Epithymum* (L.) Murr. one with short, the other with long styles. Careful comparative studies with specimens of *C. pentagona* Engelm., received from Yuncker as *C. arvensis*, have shown that the so-called "cuscuta grossa" (large dodder), causing great damage in Italy, belongs to this species. The authors do not, however, appear to accept without reservations the conclusions of Fiori as to the similarity of *C. pentagona* Engelm. and *C. Cesatiana* Bertol. An ecological distribution is also mentioned. The small dodder (*C. Epithymum*) is preferably distributed wherever clover and alfalfa are cultivated, while the distribution of *C. pentagona* (the large dodder) seems to be correlated to the distribution of legumes only in the north of Italy. In the central part of the peninsula, it is found chiefly as a parasite on beets.—*A. Bonazzi.*

543. Carano, Enrico, e Valeria Bambacioni. **Ricerche sul genere Bellis L., con speciale riguardo alla B. hybrida Ten.** [**Researches on the genus Bellis L., especially regarding Bellis hybrida Ten.**] Ann. Botanica **16**: 9–70. *Fig. 1–13.* 1923.—The authors report observations on *B. perennis* L., *B. sylvestris* Cyr., *B. annua* L., *B. hybrida* Ten., *B. cærulescens* Coss., *B. Bernardi* Boiss. & Reut., *B. margaritaefolia* and *B. prostrata* Pomel, from nature and cultural experiments, especially regarding the identity of *B. hybrida* Ten. as a species. They also report results of crosses between *B. perennis* L. × *B. annua* L. and *B. perennis* × *B. sylvestris*, and reciprocals, with observations on natural hybrids of same. They conclude that *B. hybrida* is neither a form nor a variety, much less an independent species, but a stage in the epigeous vegetation of *B. perennis* L. the internodes of the branches of which are long or short according to the seasonal and environmental conditions under which ramification takes place. Extensive bibliography is appended.—*P. D. Caldis.*

544. Carano, Enrico, e Valeria Bambacioni. **Sopra alcuni risultati di ricerche colturali e di esperimenti di ibridazione nel gen. Bellis.** [**Some results of cultural tests and hybridization experiments in the genus Bellis.**] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. Nat. **31**^{2}: 48–49. 1922.—The conclusion is reached that *Bellis hybrida* Ten. can not be retained as an entity distinct from *B. perennis*, because (1) seeds of either type would produce the other type if grown under suitable conditions, and (2) all degrees of intermediate variations exist. The theory of Tenore that *B. hybrida* might be a hybrid between *B. perennis* and *B. annua* was tested by making reciprocal crosses and growing the 2nd generation plants. Neither 1st nor 2nd generation plants gave the *B. hybrida* type. A cross between *B. perennis* and *B. sylvestris* Cyr. gave hybrids resembling *B. sylvestris* but quite different from *B. hybrida.* —*F. M. Blodgett.*

545. Chase, Agnes. **The identification of Raddi's grasses.** Jour. Washington (D.C.) Acad. Sci. **13**: 167–179. 1923.—Guiseppe Raddi, born in Florence in 1770, was sent to Brazil in 1817 by the Grand Duke of Tuscany, to join a scientific expedition sent to that country by the Austrian Emperor. For 2 years he collected seeds and living plants for the botanical gardens of Tuscany, and later 3 books based on his work in Brazil were published. In 1922 Mrs. Chase studied Raddi's collection of grasses in the University of Pisa and in the Museum at Florence. An annotated list of the Raddi species follows: *Rettbergia bambusioides, Olyra pubescens, O. glaberrima, O. ciliatifolia, O. floribunda, Pharus brasiliensis, Spartina brasiliensis, Paspalus obtusifolius = Axonopus obtusifolius* (Raddi) Chase, *P. acuminatus, P. longiflorus, P. fissifolius = Axonopus fissifolius* (Raddi) Chase, *P. curvistachyus, P. corcovadensis, P. inaequivalvis, P. compressicaulis, Acicarpa sacchariflora, Agrosticula muralis, Aira brasiliensis, Arundinella brasiliensis, Navicularia hirta = Ichnanthus hirtus* (Raddi) Chase, *N. glabra, N. lanata, Oplismenus brasiliensis, Panicum uncinatum, P. pulchellum, P. olyraefolium, P. condensatum = Hymenachne condensata* (Raddi) Chase, *P. donacifolium = Hymenachne donacifolia* (Raddi) Chase, *P. paspaloides, P. divaricatum, P. macrophyllum, P. purpurascens, P. Rudgei (β) brasiliense, Setaria sulcata, Poa brasiliensis, Megastachya Swainsoni.*—*Helen M. Gilkey.*

546. Chiovenda, E. **Le piante raccolte dal Dott. Ettore Bovone al Catanga nel 1918–21** [**Plants collected by E. Bovone in Catanga 1918–21.**] Nuovo Gior. Bot. Ital. **29**: 105–119. 1923. Descriptions of the following new species and variety are included: *Brachyaria glycerioides* Chiov., *Brachiaria platyrhachis* Chiov. (*Panicum platyrhachis* Chiov.), *Setaria thermitaria* Chiov., *Danthoniopsis Gossweileri* Stapf var. *catangensis* Chiov., *Orthosiphon minimiflorum* Chiov., **Bovonia** Chiov. new gen. of the Labiatae, *B. diphylla* Chiov., *Clerodendron humile* Chiov., and *Borreria hedraeanthoides* Chiov.—*J. M. Greenman.*

547. Cook, O. F. **Opsiandra, a new genus of palms growing on Maya ruins in Petén, Guatemala.** Jour. Washington [D. C.] Acad. Sci. **13**: 179–184. 1923.—**Opsiandra** n. gen. of the family Synechanthaceae, with the species *O. maya*, is described. A striking character is the persistence of staminate flowers and buds after the fruits have matured.—*Helen M. Gilkey.*

548. Cortesi, Fabrizio. **Osservazioni sistematiche su alcune specie del gen. Convolvulus Linn.** [**Systematic observations on some species of the genus Convolvulus Linn.**] Ann. Botanica **16**: 139–153. 1923.—The author reviews *C. Scammonia* L., *C. farinosus* Linn., and *C. hirsutus* Stev., concluding that *C. neglectus* Ten. is a synonym for *C. farinosus* and is

distinctly different from *C. Scammonia* Linn., with which it is often confused. *C. farinosus* Linn., is distinctly different from *C. hirsutus* Stev.—*P. D. Caldis.*

549. Craib, Wm. G. **Some new species from Siam.** Gard. Chron. 72: 363. 1922.—Notes are given on several plants collected by A. F. G. Kerr; and 1 new species, *Didymocarpus Wattiana* Craib, is described.—*P. L. Ricker.*

550. Dahlstedt, H. **Nye Hieracium-Arter fra Danmark. Med Indledning og Anmaerkninger af K. Wiinstedt.** [**New species of Hieracium from Denmark with an introduction and remarks by** K. Wiinstedt.] Bot. Tidsskr. 37: 241–252. 1922.—Dahlstedt gives descriptions and habitats of the following new species: *Hieracium Gelerti, H. marginelliceps, H. pachyodon, H. grandifoliatum, H. Fioniae, H. pseudo-gelerti, H. pseudanfractum,* and *H. farumense.*—*A. L. Bakke.*

551. Docters van Leeuwen, W. **Ueber eine Galle an Kibessia azurea DC., irrtümlich angesehen für eine Frücht einer anderen Kibessia-Art: Kibessia sessilis Bl.** (**On a gall on Kibessia azurea DC. erroneously taken for a fruit of another species: K. sessilis Bl.**) Bull. Jard. Bot. Buitenzorg III. 1: 131–135. *Fig. 1–4.* 1919.—The author shows that *Kibessia sessilis* was based by Blume on specimens of *K. azurea* DC. bearing near the base of the petioles large sessile galls which Blume took for fruits. The illustrations show the growth and structure of the gall and the shape of the real fruit.—*Alfred Rehder.*

552. Domin, K. **Beiträge zur Flora und Pflanzengeographie Australiens.** [**Contributions to the flora and plant geography of Australia.**] (Continued from Heft 85.) Bibliotheca Bot. 89[1]: 1–89, [555–643]. *Pl. XIX–XXII, fig. 118–135.* 1921.—This installment covers 13 families of the dicotyledons from the Casuarinaceae to the Amarantaceae. Synonymy and notes on distribution and taxonomy are included along with descriptions of new forms. The following new species, varieties, combinations, and names are proposed: *Piper harveyanum, P. bellendenkerensis, Trema aspera* var. *xerophila, Ficus infectoria* Roxb. var. *Cunninghamii* (*Urostigma Cunninghamii* Miq.), var. *psychotriifolium* (*U. psychotriaefolium* Miq.) and var. *Fraseri* (*U. Fraseri* Miq.), *F. Thynneana* Bail. var. *minor, F. Shirleyana, F. Baileyana* (*F. macrophylla* var. *pubescens* Bail.), *F. Nugentii* (*F. scandens* var. *australis* Bail.), *F. xerophila, F. yarrabensis, Elatostemma reticulatum* Wedd. var. *glabrum* and var. *minus, Boehmeria platyphylla* D. Don var. *austroqueenslandica* (*B. macrostachya* Bail.), *Pouzolzia hirta* Hassk. var. *quinquenervis* (*Urtica quinquenervis* Wall.) and var. *lythroides* (*Hyrtanandra lythroides* F. v. Muell.), *Pipturus argenteus* Wedd. var. *calcicolus, Petrophila pulchella* R. Br. var. *sessilis* (*P. sessilis* Sieb.) and var. *canescens* (*P. canescens* A. Cunn.), *Conospermum taxifolium* Smith var. *lavandulifolium* (*C. lavandulaefolium* A. Cunn.), *Persoonia stradbrokensis, P. laevis* (*Linkia levis* Cavan.), *P. Amaliae, P. adenantha* and var. *salicifolia, Helicia subrhombifolia, Grevillea pteridifolia* Knight var. *Mitchellii* (*G. Mitchellii* Hook.), *G. asplenifolia* Knight var. *longifolia* (*G. lonifolia* R. Br.), *G. decora, G. striata* R. Br. var. *lineata* (*G. lineata* R. Br.), *Hakea tenuifolia* (*Banksia tenuifolia* Salisb.), *H. acacioides, H. microcarpa* R. Br. var. *patula* (*H. patula* R. Br.) *Lomatia silaifolia* R. Br. var. *typica,* forma *angustifolia* (var. *angustifolia* R. Br.), f. *latifolia* (var. *latifolia* R. Br.), and f. *pinnata* (var. *pinnata* R. Br.), var. *stenoloba* and var. *divaricata, L. myricoides* (*Embothrium myricoides* Gaertn.), *Banksia integrifolia* L. f. var. *oblongifolia* (*B. oblongifolia* Cavan.), *Santalum lanceolatum* R. Br. var. *oblongatum* (*S. oblongatum* R. Br.), *Exocarpus floribunda, Villaresia adenophylla, Viscum pycnanthum, V. opuntia* Thunb. var. *distichum* (*V. distichum* Endl.), *Loranthus celastroides* Sieb. var. *eucalyptifolius* (*L. eucalyptifolius* Sieb.) and var. *longicarpeus, L. longiflorus* Desrouss var. *savannorum, L. exocarpi* Behr. var. *subfalcatus* (*L. subfalcatus* Hook.), *L. signatus* F. v. Muell. var. *angustatus* and var. *cardiophyllus, L. bifurcatus* Benth. var. *queenslandicus, L. pendulus* Sieb. var. *congener* (*L. congener* Sieb.) and var. *taeniifolius, L. quandang* Lindl. var. *villiflorus, L. glaber, Xylochlamys queenslandica, Polygonum orientale* L. var. *cochinchinense* (*Lagunea cochinchinensis* Lour.), *P. Dietrichiae, P. strigosum* R. Br. var. *glabratum, Rumex Clementii, Rhagodia parabolica* R. Br. var. *reclinata* (*R. reclinta* A. Cunn.), *R. nutans* R. Br. var. *fallacina, Atriplex neurivalvis, A. lobaticarpa* (*A. Muelleri* Benth. var. *lobaticarpa* F. v. Muell.), *A. cornigera, Sclerolaena bicornis* Lindl. var. *horrida, S. muricata* (*Anisacantha muricata* Moq.), *S. Birchii* (*A. Birchii* F. v. Muell.), *S. divaricata* (*A. divaricata* R. Br.), *S. Drummondii* (*A. Drummondii* Benth.), *S. bicuspis* (*A. bicuspis* F. v. Muell.), *S. anisacanthoides* (*Echinopsilon anisacanthoides* Muell.)

S. recurvicuspis (*Bassia recurvicuspis* W. V. Fitzgerald), *S. glabra* (*Kentropsis glabra* F. v. Muell.), *S. Forrestiana* (*Bassia Forrestiana* F. v. Muell.), *S. tridens* (*Bassia tridens* F. v. Muell.) *S. astrocarpa* (*B. astrocarpa* F. v. Muell.), *S. hostilis* (*B. hostilis* Diels), *Coilocarpus brevicuspis* (*Anisacantha brevicuspis* F. v. Muell.), *Suaeda maritima* Dumort. var. *australis* (*Chenopodium australe* R. Br.), *Salsola australis* R. Br. var. *strobilifera* (*S. Kali* var. *strobilifera* Benth.), *Deeringia arborescens* (*Lestibudesia arborescens* R. Br.), *Amarantus hybridus* L. var. *patulus* (*A. patulus* Bertol.), and var. *chlorostachys* (*A. chlorostachys* Willd.), *A. Clementii*, *A. Mitchellii* Benth. var. *strictifolius*, *A. cuspidifolius*, *A. cochleitepalus*, *Trichinium obovatum* Gaud. var. *atriplicifolium* (*T. atriplicifolium* A. Cunn.), *T. subviride*, *T. fusiforme* R. Br. var. *gracile* (*T. gracile* R. Br.), *Ptilotus leianthus*, *Achyranthes aspera* L. var. *australis* (*A. australis* R. Br.), *Alternanthera denticulata* R. Br. var. *uliginosa*, *A. micrantha* (*A. denticulata* var.? *micrantha* Benth.), *A. major* (*A. nana* var *major* Benth.), *A. angustifilia* R. Br. var. *macrocephala*, *Gomphrena leontopodioides*. Two new genera are proposed: **Xylochlamys** (Loranthaceae) and **Coilocarpus** (Chenopodiaceae).—*K. M. Wiegand.*

553. Engler, A. **Ein neuer Rhamnus aus Tripolis. [A new Rhamnus from Tripoli.]** Bot. Jahrb. **58**: 243. 1923.—This is issued under the general heading of Beiträge zur Flora von Afrika. L., edited by A. Engler. *Rhamnus tripolitanus* is here given its 1st Latin description, though probably originally proposed in Engler & Drude Veg. der Erde IX. III. 2. 311. 1921.—*K. M. Wiegand.*

554. Gilg, E., und R. Schlechter. **Die Monimiaceen-Gattung Idenburgia. [The genus Idenburgia of the family Monimiaceae.]** Bot. Jahrb. **58**: 244–248. *2 fig.* 1923.—This is No. 82 issued under the general title Beiträge zur Flora von Papuasien. X, edited by C. Lauterbach. The authors do not agree with Miss L. S. Gibbs that *Trimenia* and its allies should be separated as a distinct family, but treat this group as Monimiaceae subfamily Trimenioideae. Syncarpy occurs in *Idenburgia* as a unique feature in this family. A key to the genera in the subfamily is given. *Idenburgia pachyphylla*, *I. elaeocarpoides*, and *Trimenia myricoides* (*T. papuana* Gilg. & Schl., non Ridl.) are proposed as new.—*K. M. Wiegand.*

555. Hallier, Hans. **Über die Lennoeen. eine zu Linné's Bicornes verirrte Sippe der Borraginaceen. [On the Lennoaceae, referred erroneously to Linnaeus' Bicornes, a group of the Borraginaceae.]** Beih. Bot. Centralbl. II Abt. **40**: 1–19. 1923.—Hallier discusses Solms-Laubach's opinions on the systematic position of certain families and species. In 1889 Engler and Prantl stated that Torrey, and later Solms-Laubach, have convincingly shown that Linneus was right in placing the Lennoaceae with the Ericaceae and Pyrolaceae. Hallier in Juliania in 1908 placed them in the Borraginaceae. After discussing and comparing structures, he concludes that the inflorescence, peculiarities of the corolla, cells of the ovary, horizontal anatropus ovules, the arrangement of stony one-seeded fruits, and structure of the glandular hairs all agree with the Borraginaceae and in some instances resemble the Hydrophyllaceae.—*L. Pace.*

556. Harms, H. **Cucurbitaceae africanae. [Cucurbitaceae of Africa.]** Bot. Jahrb. **58**: 238–242. 1923.—This is issued under the general heading of Beiträge zur Flora von Afrika. L, edited by A. Engler. Seven species are treated. The following are proposed as new: *Momordica diplotrimera*, *M. angustisepala*, *M. pauciflora* Cogn., *M. umbellata* (*Peponia umbellata* Cogn.), *Trochomeria dentata* Cogn., and *Coccinia Stolzii*.—*K. M. Wiegand.*

557. Hayek, August. **Cerastium uniflorum Clairv. var. Hegelmaieri Correns, die Kalkrasse des C. uniflorum. (Cerastium uniflorum Clairv. var. Hegelmaieri Correns, the limestone race of C. uniflorum.** Vierteljahrsschr. Naturforsch Ges. Zürich **67**: 67–69. 1922.—. *Cerastium Hegelmaieri* Correns is a limestone form of *C. uniflorum* Clairv.—*John H. Schaffner.*

558. Hitchock, A. S. **Dissanthelium, an American genus of grasses.** Jour. Washington [D. C.] Acad. Sci. **13**: 223–225. 1923.—Three species are now refcrred to this genus, 2 occurring in the mountains of Peru and Bolivia, 1 of these also in Mexico, and the 3rd only on islands off the southern coast of California. The nomenclature of the Peruvian species has been much confused, hence the author cites the 3 species, *D. californicum*, (Nutt.) Benth., *D. calycilum* (*Brizopyrum calycinum* P.), and *D. minimum* Pilger with complete synonymy.—*Helen M. Gilkey.*

559. Honda, Masaji. **Revisio graminum Japoniae II.** Bot. Mag. Tokyo **37:** 21–26. 1923.—*Panicum Nakaianum* and *P. patens* L. f. *latifolium* are described as new. *P. distachyum* L. var. *pseudodistachyum* is published as a new name.—*J R. Schramm.*

560. Howard, A., G. L. C. Howard, and Abdur Rahman Khan. **The wheats of Bihar and Orissa.** Mem. Dept. Agric. India. Bot. Ser. **12:** 1–20. 1922.—The classification is carried to the agricultural type (unit species) and 122 types belonging to 12 botanical varieties of *Triticum vulgare* Vill. are described in detail. Three new varieties are constituted, namely: var. *nigricans*, var. *indicum*, and var. *bengalensis*. Attention is drawn to the importance of such collections of pure lines as raw material for the plant-breeder and the mycologist, and for the training of students.—*A. Howard.*

561. Keller, Robert. **Ueber neue Arten der Gattung Hypericum.** [**New species of the genus Hypericum.**] Bot. Jahrb. **58:** 190–199. 1923.—A revision of the material in the Berlin Museum has made necessary some critical notes on the genus, and the proposal of the following new species: *Hypericum turfosum*, Korea, *H. Taqueti*, Korea, *H. kushakuense*, Formosa, *H. Seleri*, California, *H. Preussii*, Central or South America, *H. Woodii*, Natal, *H. oshimaense*, Japan, *H. revolutum*, Georgia U. S. A. (related to *H. rosmarinifolium* Lam.), *H. spathulatum*, Georgia, (related to *H. nudiflorum* Michx.), *H. Sellowianum*, Brazil, *H. Jahnii*, Venezuela, *H. globuliferum*, Madagascar, *H. hondurasense*, Honduras, *H. Harperi*, Georgia (related to *H. Drummondii* T. & G.), *H. longibracteatum*, Costa Rica, and *H. altissimum*, Brazil and Paraguay. Notes are given on *H. Aitchisonii* Drum., *H. Ascyron* L., *H. erectum* Thunb., *H. hakonense* Savi., *H. morarense* Kel., *H. Wichurae* Kel., *H. adenocarpum* Mirb., *H. japonicum* Thunb., and *H. Lalandii* Choisy.—*K. M. Wiegand.*

562. Kränzlin, Fr. **Mitteilungen aus dem Herbar des Instituts für allgemeine Botanik.** [**Contributions from the herbarium of the Institute for General Botany.**] Mitteil. Inst. Allg. Bot. Hamburg **5:** 236–240. 1922 [1923.]—The following are described as new: *Odontochilus upoluensis*, Samoa, previously identified by the author from poor material as *Goodyera biflora* Hook. f.; *Dendrobium vitiense*, Fiji Islands; *Angraecum sesquisectangulum* and *Eulophia grandibractea*, Madagascar. *Microstylis platychila* Rchb. f., Fiji Islands, is redescribed from ample material. *Isochilus crassiflorus* Rich. & Gal., Mexico, is redescribed from living plants in the Botanical Garden at Hamburg, and a brief discussion of this species is given.—*J. R. Schramm.*

563. Krause, K. **Note on Schizocasia Regnieri.** Jour. Washington [D. C.] Acad. Sci. **13:** 253. 1923.—The writer describes the inflorescence of a cultivated aroid, *Schizocasia Regnieri* L. Linden & Rod., originally of Siam, which has long been used in gardens but which has not heretofore been known in flower.—*Helen M. Gilkey.*

564. Lundström, Erik. **Über Papaver nudicaule L. und P. radicatum Rottb. in Fennoskandia und Arktis sowie über einige mit P. nudicaule verwandte Arten.** [**On Papaver nudicaule L. and P. radicatum Rottb. in Fennoscandia and Arctis and on some other related species.**] Acta Horti Bergiani **7:** 403–430. *Pl. 1–2, fig. 1–2.* 1923.—The author gives a brief historical sketch of the literature on *Papaver nudicaule* L. and *P. radicatum* Rottb. and points out the differences between the 2 species. The former has thin capsules, white lactescence, and sparse hairiness on the stem; the latter, thick capsules, yellow lactescence, and dense hairiness. The following names, forms and combinations are new: *P. radicatum* Rottb. f. *typicum* and subf. *islandicum*, subspp. *faeroënse* and *occidentale; P. nudicaule* L. var. *genuinum* and var. *genuinum* f. *albiflorum* and f. *arctosibiricum*, subspp. *relictum* and *kvaenangense; P. rubro-aurantiacum* (Fisch.) E. Lundstr. and subsp. *Langeanum; P. Ledebourianum*, and *P. radicatum* × *rubro-aurantiacum* subsp. *Langeanum.* There are notes on the hybrid *P. nudicaule* × *radicatum* and a survey is given of the distribution in Arctis and Fennoscandia of *P. nudicaule*, *radicatum*, and *rubro-aurantiacum.*—*O. Heilborn.*

565. Mildbraed, J. **Cochlospermaceae africanae.** [**Cochlospermaceae of Africa.**] Bot. Jahrb. **58:** 234–237. 1923.—This is issued under the general heading of Beiträge zur Flora von Afrika. L, edited by A. Engler. Four species are treated, with the addition of copious notes. *Cochlorspermum intermedium* and var. *serratum* are proposed as new.—*K. M. Wiegand.*

566. Mildbraed, J. **Iridaceae africanae.** [**Iridaceae of Africa.**] Bot. Jahrb. **58:** 230–233. 1923.—This is issued under the general heading of Beiträge zur Flora von Afrika.

L, edited by A. Engler.—The genus Zygotritonia is proposed as new, also the following species, varieties, and combinations: *Zygotritonia bongensis* (*Tritonia bongensis* Pax) and var. *robusta*, *Z. nyassana*, and *Z. gracillima*. Notes are given on *Gladiolus unguiculatus* Bak. and *G. uhehensis* Harms.—*K. M. Wiegand.*

567. Nakai, Takenoshin. **Notulae ad plantas Japoniae et Koreae XXIX.** [Notes on plants of Japan and Korea XXIX.] Bot. Mag. Tokyo 37: 1–17. 1923.—The following are described as new: *Thalictrum capillipes*, *Rubus pacificus*, *Celastrus lancifolia*, *Vaccinium axillare* var. *platyanthum*, *Cynoglossum formosanum*, *C. tosaense*, *C. villosulum*, *C. asperrimum* and var. *yesoense*, *Goodyera yakushimensis*, *G. boninensis*, *Vicia pseudo-venosa*, *V. deflexa*, *V. senanensis*, *V. subcuspidata*, *V. bifolia*. *Rosa Thoryi* var. *carnea* and *Vicia nipponica* β *capitata* appear as new combinations.—*J. R. Schramn.*

568. Osterhout, Geo. E. **Two new plants from Colorado.** Bull. Torrey Bot. Club 50: 217–218. 1923.—*Draba alpicola* and *Oreocayra stricta* are described as new species.—*P. A. Munz.*

569. Pampanini, R. **Le "Spiraea lancifolia" Hoffmannsegg e "decumbens" Koch.** Nuovo Gior. Bot. Ital. 29: 67–88. 1923.—An exhaustive study of the literature of the geographic distribution and structure of the plants established the fact that there is only 1 species, *S. lancifolia*.—*Ernst Artschwager.*

570. Pfeiffer, H. **Beiträge zur Morphologie und Systematik der Gattungen Lagenocarpus und Cryptangium I.** [Contribution to the morphology and taxonomy of the genera Lagenocarpus and Cryptangium I.] Ber. Deutsch. Bot. Ges. 39: 125–134. 1921.—*Lagenocarpus* Nees was proposed [without description] in 1834 and placed in the tribe Sclerieae. In 1840 Nees described the genus *Anogyna* based on collections by Schomburgk in the Lindley herbarium, no species being given. In 1842 Nees described *Lagenocarpus* (referring to it, as synonyms, 4 [unpublished] generic names of Schrader, *Microlepis*, *Adamantogeton*, *Orobium*, and *Phaenopyrum*, as well as his own *Anogyna*) and also *Cryptangium* Schrad. and *Acrocarpus* Nees. Steudel placed *Lagenocarpus*, *Cryptangium* and *Acrocarpus* under *Scleria*, section *Paniculatae*. Boeckeler maintained *Lagenocarpus* and *Cryptangium* (including *Acrocarpus*) as distinct from *Scleria* and from each other, placing them in tribe *Sclerieae*. Later Boeckeler decided that *Lagenocarpus* and *Cryptangium* were but one genus. Bentham and Hooker held them distinct and placed them, together with other South American plants, in a new tribe *Cryptangieae*. This tribe, *Sclerieae* and *Cariceae* together, were characterized by unisexual flowers. Bentham and Hooker remark that *Lagenocarpus* is scarcely distinct from *Cryptangium*. Durand agrees with Bentham and Hooker. Pax differentiates the 2 on fruit 3-angled, styles 3, and fruit 3–5-furrowed, styles 3 to 5. The author regards these differences as specific only, as does Kuntze who unites the 2 genera. Baillon holds them distinct and places them in tribe *Cariceae*. Dalla Torre follows Pax. Post and Kuntze unite *Cryptangium* and *Lagenocarpus*. Clarke holds the 2 distinct and places a new genus, *Exochogyne* Clarke (based on *Ule* 6128, Brazil) between them. The author made morphological and anatomical studies in order to determine the status of these genera. Not only are they difficult to distinguish, but the nomenclature of the species is badly involved. Besides the 3–5 ribs the fruit of *Lagenocarpus* often bears a beak, but there are species with the typical beakless fruit. The 3-angled caryopsis of the Schomburgk plant [basis of *Anogyna* and also of *Lagenocarpus guianensis* Lindl. & Nees] would place it in *Cryptangium*. The author therefore concludes that the characters relied upon by Pax and others to distinguish the 2 genera are not generic, but are specific only. Study of the anatomy of the species as a whole (which the author intends to publish later) shows many characters in common. The standing of *Exochogyne* Clarke is for the present uncertain. The author amends *Lagenocarpus* Nees, and gives a list of the species with synonymy. The following combinations are new: *Lagenocarpus brevifolius* (*Cryptangium brevifolium* Boeck.), *L. ciliatus* (*C. ciliatum* Boeck.), *L. comatus* (*C. comatum* Boeck.), *L. dioicus* (*C. dioicum* Boeck.), *L. distichophyllus* (*C. distichophyllum* Boeck.), *L. Glaziovii* (*C. Glaziovii Boeck.*), *L. griseus* (*C. griseum* Boeck.), *L. insignis* (*C. insigne* Boeck.), *L. melanocarpus* (*C. melanocarpum* Boeck.), *L. pauciflorus* (*C. pauciflorum* Boeck.), *L. Schenckianus* (*C. Schenckianum* Boeck.)—*A. Chase.*

571. Pittier, H. **Acerca del genero Gyranthera Pittier.** [On the genus Gyranthera Pittier.] Contribuciones para la flora Venezuela. Bol. Com. e Indust. [Caracas] 1921: 428–433.

1921. (Reprint P. 14–19).—The type of this genus of the Bombacaceae was described in 1914 from Panama. The author now describes a 2nd species, *G. caribensis*, defines the place of the genus among the *Bombacineae*, and gives complementary details on the generic characters.—*H. Pittier.*

572. Pittier, H. **Arboles y arbustos nuevos de Venezuela. Primera decada. [New trees and shrubs of Venezuela. First decade.]** Contribuciones para la flora de Venezuela. Bol. Com. e Indust. [Caracas] **1921**: 417–428. 1921. (Reprint P. 1–14.)—Notwithstanding the general opinion, the tree flora of Venezuela is very little known. In this 1st contribution, the following 10 species are described: *Inga guaremalensis, Raputia heptaphylla, Esenbeckia Atata, Trichilia lanceolata, Stillingia arborescens, Gustavia eximia, Mouriria pseudo-geminata, Oxythece caracasana, Pouteria carabobensis, Sideroxylum amygdalicarpum.*—*H. Pittier.*

573. Pittier, H. **Arboles y arbustos nuevos de Venezuela. Segunda y tercera decadas. [New trees and shrubs of Venezuela. Second and third decades.]** Contribuciones para la flora de Venezuela. *8 vo. P. 21–43.* Caracas, 1923.—This contains descriptions of the following new species: *Panopsis cinnamomea, Roupala mollis, R. pseudocordata, Hirtella leonotis, Copaifera fissicuspis, Lonchocarpus pictus, Pilocarpus Alvaradoi, Guarea mollicoma, Qualea calophylla, Senefeldera testiculata, Sloanea zuliaensis, Bombax carabobense, Bombacopsis mucronulata, B. pachiroides, B. sepium, Carpotroche zuliana, Lecythis bipartita, Labatia parviflora, Chrysophyllum parvulum, Citharexylum subthyrsoideum.*—*H. Pittier.*

574. Rehder, Alfred. **New species, varieties and combinations from the herbarium and the collections of the Arnold Arboretum.** Jour. Arnold Arboretum **4**: 107–116. 1923.—The following new combinations, new varieties, and hybrids are proposed: *Cephalotaxus drupacea* var. *nana* (Nakai); *Taxus media, T. media* f. *Hatfieldii* and f. *Hicksii; Abies Nordmanniana* f. *tortifolia; Picea Abies* f. *argentea* (Berg), f. *mucronata* (Loud.), f. *columneris* (Jacques), f. *cupressina* (Thomas), f. *Veitchii* (Hornibrook), f. *Parsonsii* (Hornibrook), f. *erythrocarpa* (Purk.); × *Populus canddensis* Moench var. *serotina* (Hartig), var. *serotina* f. *erecta* (Selys-Longch.), var. *serotina* f. *aurea* (van Geert), var. *regenerata* (Schelle), var. *marilandica* (Bosc.); × *Ribes Knightii; Cotoneaster Franchetii* Bois var. *cinerescens; Pyracantha crenulata* var. *kansuensis; Malus yunnanensis* var. *Veitchii;* × *Acer zoeschense* f. *elongatum* (Schwerin).—*Alfred Rehder.*

575. Rydberg, Per Axel. **Notes on Fabaceae-I.** Bull. Torrey Bot. Club **30**: 177–187. 1923.—Critical notes are given for species of the genus *Homalobus* Nutt. *H. Standleyi* from New Mexico and *H. retusus* from Yukon are described as new species.—*P. A. Munz.*

576. Sands, W. N. **Botanical notes on the Brazil-nut tree in Malaya.** Malayan Agric. Jour. **10**: 130–132. 1922.—All of the 50 trees grown from Brazil-nuts received from Kew in 1912, 2 of which have fruited, apparently belong to 1 species. Whether this species should be called *Bertholletia excelsa* Humb. & Bonpl. or *B. nobilis* Miers, is left to "the Kew authorities."—*Howard B. Frost.*

577. Sargent, C. S. **Notes on North American trees, XI.** Jour. Arnold Arboretum **4**: 99–107. 1923.—This paper deals with *Crataegus*, and the following new species and new names are proposed: *Crataegus Stevensiana, C. franklinensis, C. Milleri, C. iterata*, nov. nom., *C. Putnamiana. C. illecebrosa, C. mansfieldensis, C. pagensis*, and *C. Youngii.*—*Alfred Rehder.*

578. Schellenberg, Gustav. **Connaraceae africanae IV. [Connaraceae of Africa IV.]** Bot. Jahrb. **58**: 200–229. 1923.—This is issued under the general heading of Beiträge zur Flora von Afrika. L, edited by A. Engler. The author presents his treatment of the genera *Agelaea* and *Connarus*. Under *Agelaea* there is an extended discussion of the value of characters in the segregation of the genus, and 7 groups are made based primarily on types of pubescence. The following species and combinations are proposed as new: *Agelaea villosiflora, A. annobonensis, A. Conraui, A. grisea, A. longecalyculata, A. tenuinervis, A. floccosa, A. neglecta, A. setulosa, A. longifoliata, A. ustulata, A. elegans, A. gracilis, A. oligantha* Gilg, *A. macrocarpa, A. Zenkeri, A. obovata, A. pseudobliqua, A. lucida, A. ovalis, A. australis, A. ugandensis, A. phaseolifolia* Gilg, *A. marginata, A. cordata, Connarus Mildbraedii, C. Thonningii* (*Omphalobium Thonningii* DC.), *C. triangularis, C. puberulus, C. subsericeus, C. orientalis, C. incurvatus*, and *C. obovatus.*—*K. M. Wiegand.*

579. Schellenberg, Gustav. **Die bis jetzt aus Neu-Guinea bekannt gewordenen Opiliaceae, Olacaceae und Icacinaceae** [The Opiliaceae, Olacaceae and Icacinaceae so far known from New Guinea.] Bot. Jahrb. 58: 155–177. 1923.—This paper is a catalogue of the species so far known, with critical notes on synonymy, distribution, and technical characters. About 52 species are included. The following new species and combinations are proposed: *Anacolosa papuana, Stemonorus papuanus* (*Platea papuana* Becc.), *S. montanus, S. viridis, S. impressus* (*Gomphandra impressa* Ridl.), *S. gracilis, Urandra monticola, Rhytidocaryum* (*Ryticaryum* and *Rhyticaryum* Becc.) *oblongum, R. bullatum, R. elongatum, R. gracile, R. ovale, R. purpurascens, R. rotundatus, R. pulchrum, R. elegans, R. urophyllum,* and *R. lucidum.*—*K. M Wiegand.*

580. Schellenberg, Gustav. **Die Connaraceen Papuasiens.** [The Connaraceae of Papuasia.] Bot. Jahrb. 58: 178–181. 1923.—Only 2 genera, *Santaloides* and *Connarus,* reach the region. It is interesting that Connaraceae are found only on the old volcanic islands, not on the newer coral islands. This is probably to be explained by the large heavy seeds of which the arillus alone is edible for birds. The seeds are dropped before they are carried far. The species themselves have generally a very limited range. The following new species and combinations are included: *Santaloides papuanum, S. Balanseanum* (*Rourea Balanseana* Baill.), *S. samoense* (*Rourea samoensis* Lauterb.), and *Connarus Peekelii.*—*K. M. Wiegand.*

581. Schlechter, R. **Neue Orchidaceen Papuasiens.** [New Orchidaceae of Papuasia.] (Cont.) Bot. Jahrb. 58: 97–154. 1923.—This is issued under the general title Beiträge zur Flora von Papuasien IX, edited by C. Lauterbach.—Descriptions of the following new species are included: *Desmotricum sepikanum, D. ischnophyton, D. opilionites, D. eustachyum, D. leucochysum, D. brachycalyptra, D. eumelinum, D. mystroglossum, D. rhabdoglossum, D. roseoflavidum, D. Stolleanum, D. trachythece, D. xanthogenium, D. brachyphyta, D. cyperifolium, D. gemma, D. microblepharum, D. tumidulum, D. ceraceum, D. chrysosema, D. Dielsianum, D. serratipetalum, D. lambusiforme, D. longicaule, D. Peekelii, D. polyphyllum, D. dolichocaulon, D. subbilobatum, D. vinosum, D. vagans, D. podocarpifolium, Pseuderia Ledermannii, P. robusta, P. sepikana, Eria fractiflexa, E. hypophaea, E. Ledermannii, E. subsessilis, E. longicaulis, E. molliflora, Calanthe bracteosa, Bulbophyllum trichromum, B. rhizomatosum, B. cuspidipetalum, B. falcibracteum, B. rubrolineatum, B. serripetalum, B. phaeorhabdos, B. Stolleanum, B. bicornutum, B. bigibbum, B. longiserpens, B. fasciculiferum, B. piestobulbon, B. ablepharon, B. microthamnus, B. inaequisepalum, B. microcharis, B. atrolabium, B. lamprochlamys, Chitonanthera angustissima, C. aphanopetala, C. spathulata, Phreatia brachyphyton, P. crinonioides, P. leioglossa, P. similis, P. simplex, P. subsacculata, P. subtriloba,* and *Taeniophyllum Ledermannii* [see Bot. Absts. 12, Entry 6684.]—*K. M. Wiegand.*

582. Schulz, O. E. **Beiträge zur Kenntnis der Erythroxylaceen von Papuasien.** [Contributions to the knowledge of the Erythroxylaceae of Papuasia.] Bot. Jahrb. 58: 249. 1923.—This is No. 83, issued under the general title Beiträge zur Flora von Papuasien X, edited by C. Lauterbach. *Erythroxylon ecarinatum* Burck is discussed, and var. *Ledermannii* is described as new.—*K. M. Wiegand.*

583. Smith, Charles Piper. **Studies in the genus Lupinus-VIII. Lupinus nanus.** Bull. Torrey Bot. Club 50: 159–172. *Fig. 79–84.* 1923.—In continuation of the treatment of the section *Micranthi, Lupinus nanus* Dougl. is discussed. The following nomenclatorial changes are made: *L. nanus perlasius* var. nov., *L. nanus carnosulus* (Greene) comb. nov., *L. nanus Menkerae* var. nov., *L. nanus vallicola* (Heller) comb. nov., and *L. nanus apricus* (Greene) comb. nov.—*P. A. Munz.*

584. Smith, J. J. **Die Orchideen von Java. Sechster Nachtrag.** [The orchids of Java. Supplement 6.] Bull. Jard. Bot. Buitenzorg III. 3: 227–333. 1921.—These descriptions of numerous Javenese species include new varieties and new combinations, of which the following are new to science: *Corysanthes picta* Lindl. var. *karangensis, C. vinosa, Nervilia punctata* Schltr. var. *succedanea, Cryptostylis acutata, C. javanica, C. conspicua, Gastrodia crispa, Didymoplexis flexipes, Macodes robusta, Pholidota camelostalix* Rchb. f. var. *grandiflora, Eulophia javanica, Oberonia cirrhifera, O. indragiriensis* Schltr. var. *javanica, O. tjisokanensis,*

Microstylis humerata, Agrostophyllum Denbergeri, A. laxum, A. latilobum, Dendrobium aureilobum, D. luxurians, D. puncticulosum, D. reflexitepalum, D. corrugatilobum, Phreatia secunda Lindl. var. *tenuiscapa, Phalaenopsis fimbriata, Thrixspermum conigerum, T. acutilobum, T. iavanicum, T. malayanum, T. squarrosum, T. patens, Taeniophyllum Reijnvaaniae, Y. mammilliferum, T. Doctersii.—Alfred Rehder.*

585. Smith, J. J. **Plantae novae vel criticae ex Herbario et Horto bogoriensi. II.** [**New or critical plants from the Herbarium and Garden at Buitenzorg. II.**] Bull. Jard. Bot. Buitenzorg III. 4: 230–240. *Pl. 4–10.* 1922.—The following critical plants are described and partly figured: *Gymnosiphon aphyllum* Bl., *Phyllanthus acutissimus* Miq., *Styrax sumatranus* J. J. Sm.; and the following species, varieties or combinations are new to science: *Rinorea gaultheriiflora, Gymnartocarpus triandra, Breynia Heyneana, Clethra longispicata,* and *Rhododendron Zollingeri* J. J. Sm. var. *latifolium.—Alfred Rehder.*

586. Valeton, Th. **Elettariopsis sumatrana Val. n. sp.** Bull. Jard. Bot. Buitenzorg III. 3: 148–149. *Pl. 9, fig. 1–8.* 1921.—The species named in the title is described and figured. *—Alfred Rehder.*

587. Valeton, Th. **Hornstedtia Retz.** Bull. Jard. Bot. Buitenzorg III. 3: 150–179. *Pl. 9–13.* 1921.—The author presents a description of the genus, a discussion of the general characters, a conspectus and key to species, followed by enumeration of the species of which the following, including some varieties, are new: *Hornstedtia Pininga* Val. var. *rubriflora,* var. *aurantiaca, H. reticosa, H. elongata* K. Sch. var. *taluensis, H. Rumphii, H. deliana, H. rubra* (Bl).—*Alfred Rehder.*

588. Valeton, Th. **Nicolaia Horan. Description of new and interesting species.** Bull. Jard. Bot. Buitenzorg III. 3: 128–140. *Pl. 1–6.* 1921.—The author publishes the following new species and combinations: *Nicolaia anthodioides* (Teysm. & Binn.), *N. atropurpurea* (Teysm. & Binn.), *N. Diepenhorstii* (Teysm. & Binn.), *N. gracilis, N. grandiligulata* (K. Sch.), *N. Heyniana, N. intermedia, N. rostrata,* var. *talangensis, N. Lörzingii,* var. *singalangensis, N. solaris* var. *aurantiaca, N. subulicalyx.—Alfred Rehder.*

589. Valeton, Th. **Rhynchanthus Hook. f., Geanthus Reinw. and Geostachys Ridl.** Bull. Jard. Bot. Buitenzorg III. 3: 141–147. *Pl. 7–8.* 1921.—The author describes the following new species: *Rhynchanthus radicalis, Geanthus echinatus, G. parvus,* and *Geostachys sumatrana.—Alfred Rehder.*

590. Valeton, Th. **Some new or new-named species of Amomum sectio Euamomum K. Sch.** Bull. Jard. Bot. Buitenzorg III. 2. 354–356. 1920.—The new species *Amomum stenocarpum* from West Sumatra and *A. Blumeanum* (*A. ciliatum* Binn., non Blume) are described, and *A. maximum* Roxb. is referred to *A. dealbatum* Roxb. as a synonym.—*Alfred Rehder.*

591. Wilson, Ernest H. **The Rhododendrons of north-eastern Asia.** Rhodendron Soc. Notes 2: 93–106. 1922.—An enumeration is made of the 28 species known from northeastern Asia with keys to the subgenera, sections, and species. A short note under each species, the place of publication, and the most important illustrations are cited; notes on the habitat, discovery, and introduction into cultivation are given, and the varieties and hybrids enumerated.—*Alfred Rehder.*

592. Wright, C. H. **Pita and silk grass.** Bull. Misc. Inf. Kew **1923**: 266–267. 1923.—The name "pita" is a Spanish word applied to many different kinds of leaf fiber plants in tropical America. There is much confusion in the botanical names of these plants as well as in the vernacular names. Specimens of flowers and a bracteole from the pita plants of the Chiriguana District of Colombia are found to be identical with *Aechmea magdalenae* André, but it is a *Bromelia* and therefore the name is changed to *Bromelia magdalenae.* Synonyms and a description of the flowers are given.—*Lyster H. Dewey.*

REVISIONS AND MONOGRAPHS

593. Bakhuizen van den Brink, R. C. **Revisio generis Avicenniae.** [**Revision of the genus Avicennia.**] Bull. Jard. Bot. Buitenzorg III. 3: 199–226. *Pl. 14–22.* 1922.—The author recognizes 4 species and several varieties, of which descriptions are given with full citation of literature and synonyms and enumeration of the specimens examined. The follow-

ing combinations are new: *Avicennia marina* (Forsk.) Vierh. var. *alba* (Bl.), var. *resinifera* (Forst.), var. *intermedia* (Griff.), var. *Rumphiana* (Hall. f.).—*Alfred Rehder.*

594. Lam, H. J., and R. C. Bakhuizen van den Brink. **Revision of the Verbenaceae of the Dutch East-Indies and surrounding countries.** Bull. Jard. Bot. Buitenzorg III. 3: 1–116, i–iii. 1921.—The paper consists of a systematic enumeration of the Verbenaceae of the Malayan Archipelago, the Malay Peninsula, the Philippines, the Bismarck Archipelago, and the Palan Islands. A key to the 25 genera occurring within the area is given and there are keys to the species under each genus. Only the new and some critical species and forms are fully described, but each name is followed by a complete synonymy and the authors have dealt in detail with varieites and forms. The following species, varieties, forms, combinations, and names are new (var. *typica* and f. *typica* having been omitted): *Stachytarpheta jamaicensis* Vahl var. *indica* (Vahl), *Callicarpa pentandra* Roxb. f. *farinosa* (Bl.), f. *hexandra* (Teysm. & Binn.), var. *paloensis* (Elm.), f. *apoensis* (Elm.), f. *celebica* (Koord.), f. *furfuracea* f. *flavida* (Elm.), var. *Cumingiana* (Schau.), f. *surigaensis* (Merr.), f. *pentamera* (Lam.), f. *dentata*, *C. inaequalis* Teysm. & Binn., *C. erioclona* Schau. f. *rivularis* (Merr.), var. *subalbida* (Elm.), *C. cana* L. var. *sumatrana* (Miq.), *C. tomentosa* (*L.*) Murr. var. *lanata* (L.), var. *longipetiolata* (Merr.), var. *magna* (Schau.), *C. japonica* Thunb. var. *dichotoma* (Lour.), *Teysmanniodendron pteropodum* (Miq.), *Premna decurrens*, *P. oblongifolia* Merr. var. *major*, *P. parviflora*, *Viticipremna philippinensis* (Turcz.), *Vitex erisoclona*, *V. medusaecalyx*, *V. hawaiiensis*, *V. bogoriensis*, *V. venosa*, *V. luzonica*, *V. bankae*, *V. neglecta var. paberula*, var. *glabrior*, *V. Koordersii*, *Gmelina uniflora* Stapf. var. *villosa*, *G. asiatica* L. var. *villosa* (Roxb.), var. *philippinensis* (Cham.), *Clerodendron incisum* Klotzsch var. *macrosiphon* (Hook. f.), *C. Sahelangii* Koord., *C. macrophyllum* Bl. var. *myrmecophilum* (Ridl.), *C. fragrans* (Vent.) Willd. f. *corymbosa*, f. *pleniflora*, var. *foetida*, *C. Buchanani* (Roxb.) Walp. var. *fallax* (Lindl.), *C. squamatum* Vahl var. *Rumphiana* (de Vries & Teysm.), var. *Bethuniana* (Lowe), *C. ovalifolium* (A. Juss.), *Petraeovitex ternata* Hall. f. var. *glabrior*, *P. sumatrana*.—*Alfred Rehder.*

595. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VI. Part 9. *P. 495–570, pl. 240–243.* John Spence: Sydney, April, 1923.—The present part contains descriptions and illustrations of the following species: *Eucalyptus pruinosa* Schauer, *E. melanophloia* F. v. M., *E. Gunnii* Hook. f., *E. longicornis* F. v. M., *E. propinqua* Deane & Maiden var. *major* n. var., *E. haemastoma* Sm., *E. micrantha* DC., *E. Shiressii* Maiden & Blakely n. sp., *E. crusis* n. sp., and *E. Flocktoniae* Maiden. The author continues in this part his discussion of the inflorescence.—*J. M. Greenman.*

596. Villani, A. **Sulla classificazione delle Crocifere. [On the classification of the Cruciferae.]** Ann. Botanica 16: 71–121. 1923.—The author discusses critically classifications by other authors and proposes a new classification using the character of the pistil, the fruit, the stigma, the nectaries, stamens, embryo, anatomy of the valves, calyx, corolla, etc. as basis. He also describes the most important genera in each tribe. The crucifers are 1st divided into 2 groups: *Eustaurophorae vel gynecaeo sessili* and *Cleomopsideae vel gynecaeo pedicellato.* The 1st group is divided into 3 sub-groups, viz: *Seliquosae*, *Pseudosiliculosae*, and *Siliculosae.* The *Seliquosae* are divided into *Heteromericarpae* and *Isomericarpae.* The sterility or not of the rostrum is used in dividing the *Heteromericarpae* into the tribes *Sinapeae* and *Eruceae.* The *Isomericarpeae* are subdivided into the tribes *Brassiceae* (subtribes *Brassiciinae*, *Raphaninae*, *Diplotaxiinae*), *Cheirantheae* and *Sisymbrieae* (subtribes *Sisymbriinae* and *Erysiminae*). The *Pseudosiliculosae* comprise the only tribe *Lunarieae.* The *Siliculosae* are divided into 3 groups: *Latiseptae* (tribe *Alyssinae*, subtribes *Alyssiinae* and *Cochleariinae*) *Angustiseptae* tribe *Lepidieae*, subtribes *Lepidiinae* and *Thlaspidiinae*) and *Metamorphicae vel Nucamentaceae* (tribe *Isatidae*, subtribe *Isatidiinae*). The *Cleomopsideae* comprise the tribe *Stanleyneae.* Genealogical tables are given indicating the descendence of the genera from *Sinapis L.*—*P. D. Caldis.*

FLORISTICS AND PLANT DISTRIBUTION

597. Anonymous. [Rev. of: Gamble, J. S. **Flora of the Presidency of Madras. Part 5: Ebenaceae to Scrophulariaceae.** *P. 769–962.* Adlard and Son and West Newman: London, 1923 (see Bot. Absts. 12, Entry 3622).] Nature 111: 630. 1923.

598. Blake, S. F. **Two Mediterranean clovers new to the United States.** Science 57: 665. 1923.—Specimens of *Trifolium hirtum* All. have been found in Virginia, and of *T. angustifolium* L. in Alabama. Both species may become weeds.—*C. J. Lyon.*

599. Brown, E. **Mystery plants of Uganda.** Gard. Chron. 73: 36. Fig. 16. 1923.—Attention is called to the fact that the native has a habit of leaving any unusual plants when weeding his garden. These semi-cultivated plants often flower sooner than the wild prototype. Five plants of this type are described, and the suggestion is made that their study may provide a basis for explaining the puzzling distribution of many African plants. They are: *Ipomoea Grantii* Oliver, *Euphorbia implexa* Stapf, *Ceropegia Brownii* Ledger, *Stapelia Dummeri*, and *Pancratium sp.*—*P. L. Ricker.*

600. Cairns, John. **Trees and shrubs in a Renfrewshire garden. II. Summer.** Glasgow Nat. 8: 145–152. 1921.—Forty-two species and varieties of trees and shrubs are listed.—*Ray C. Friesner.*

601. Cockerell, T. D. A. **White-flowered Primula angustifolia.** Torreya 23: 68. 1923.—About 20 years ago a white-flowered form of *Primula angustifolia* Torr. forma *Helenae* Pollard & Cockerell was described from New Mexico. It was rediscovered in 1922 by D. M. Andrews on Arapahoe Peak, Boulder Co., Colorado.—*J. C. Nelson.*

602. Dahlgren, K. V. O. **Tillägg till Salatraktens kärlväxtflora. [Additions to the flora of the neighborhood of Sala (Sweden).]** Svensk Bot. Tidskr. 17: 96–102. 1923.

603. Fedtschenko, Olga, und Boris Fedtschenko. **Conspectus Florae Turkestanicae. [Conspectus of the flora of Turkestan.]** Beih. Bot. Centralbl. II Abt. 40: 172–222. 1923.—This paper gives the taxonomic history of specimens Nos. 2706–2886 and includes genus 470 to genus 511 as listed. *Crepis Serawschanica* B. Fedtsch. is described as new; and 3 new varieties are characterized: *Podanthum argutum* (Rgl.) Fedtsch. var. *baldschuanicum*, var. *foliosum*, and var. *elegans* O. Fedtsch.—*L. Pace.*

604. Guadagno, M. **Note ed aggiunte alla Flora dell'Isola di Capri. [Notes and additions to the flora of Capri Island.]** Nuovo Gior. Bot. Ital. 29: 44–66. 1923.—The recent study of the flora of the island yields 55 species and 20 varieties in addition to those previously known.—*Ernst Artschwager.*

605. Hers, J. **Chinese names of plants. A preliminary list of the trees and shrubs of North Honan.** Jour. North China Branch Roy. Asiatic Soc. 53: 105–117. 1922.—Scientific, Chinese, and phonetic transliterated names are given.—*J. R. Schramm.*

606. Malme, G. O. **Ett litet bidrag till Bo sockens kärlväxtflora. [A contribution to the flora of vascular plants in the parish of Bo (Sweden).]** Svensk. Bot. Tidskr. 17: 110–111. 1923.

607. Malme, G. O. **Strödda bidrag till Östergötlands kärlväxtflora. [Contributions to the flora of vascular plants in Östergötland (Sweden).]** Svensk. Bot. Tidskr. 17: 103–105. 1923.

608. Melin, E. **Sphagnum-floran i Bjurfors och Björnhyttans kronoparker. [The Sphagnum-flora in the state forests Bjurfors and Björnhyttan (Sweden).]** Svensk Bot. Tidskr. 17: 108–110. 1923.

609. Mörner, Carl Th. **Om Rosa acicularis Lindl., särskilt med hänsyn till färekomsten i vårt land. [On Rosa acicularis Lindl. with special reference to its occurrence in Sweden.]** Acta Horti Bergiani 7: 383–402. *Fig. 1–4.* 1923.—The author presents a compilation of available data on the systematic position of this species, its synonyms, variation, division into subspecies, and geographical distribution outside of Sweden. The only Swedish locality, in the north near the town of Skellefteå and known since 1852, is described in detail. Some morphological details of the Swedish plant are given. The relation between the length of sepals and petals is shown to be of no taxonomic value.—*O. Heilborn.*

610. Nelson, James C. **Additions to the flora of western Oregon during 1922.** Torreya 23: 63–67. 1923.—A list is presented of 28 species found growing spontaneously, of which 20 are introduced. The total number of species reported by the author which are not included in Piper & Beattie's Flora of the Northwest Coast has now reached 399. Corrections and range extensions of 9 species previously reported are appended. Attention is called to the large number of previously unreported species afforded by the river-shores.—*J. C. Nelson.*

611. Pires de Lima, Américo. **Subsídios para o estudo da flora de Moçambique. Espermáfitas do litoral-norte, 1ª centúria (continuação).** [Materials for the study of the Mozambique flora. Spermatophytes of the north coast; 1st century, continued.] Brotéria Sér. Bot. 20: 5–11. 1922.—For the 1st instalment of this article see Bot. Absts. 11, Entry 1988. The present paper covers Solanaceae (pars) to Cucurbitaceae and gives full descriptions of the 12 species listed. A few errors in the previous paper are noticed. *Striga diversifolia* P. Lim. is proposed as new.—*E. B. Chamberlain.*

612. Prescott, E. E., and C. French, Jr. **On four orchids new for Victoria.** Victorian Nat. 37: 107–108. 1921.—The authors list *Caladenia iridescens* Rogers n. sp., from the Grampians; *C. alba* R. Br. from Mount Dandenong; *C. cordiformis* Rogers n. sp. from Western Australia; also *C. cardiochila* Tate from South Australia. For descriptions of the new species reference is made to Proc. of the Roy. Soc. of South Australia, but without exact citation.—*Wm. Randolph Taylor.*

613. Provasi, T. **Storia e distribuzione geografica della Androsace brevis.** [Story of the geographic distribution of Androsace brevis (Heg.) Ces.] Nuovo Gior. Bot. Ital. 29: 120–141. 1923.—*Androsace brevis* is an endemic alpine form which developed under the influence of peculiar environmental conditions. For causes which are not well understood it spread to the country west of Lake Como where it found equally good if not better conditions than it enjoyed at its original station. Its adaptability, its elasticity concerning the time of flowering, and its tendency to grow in lower altitudes indicate that it is of meridional and recent origin. Since the plant now occupies 2 distinct vegetation zones it is possible that it may develop 2 distinct forms unless it is destroyed by tourists.—*Ernst Artschwager.*

614. Samuelsson, Gunnar. **Zur Kenntnis der Schweizer Flora.** [Contribution to the flora of Switzerland.] Vierteljahrsschr. Naturforsch. Ges. Zürich 67: 224–267. 1922.—Critical notes are given on various species, and rare localities for others. A hybrid *Equisetum*, namely, *E. hiemale* L. × *E. ramosissimum* Desf. is described; *Salix arbutifolia* Willd. is to be regarded as a proper species; *Rumex thyrsiflorus* Fingerh. is a synonym of *Rumex auriculatus* Wallr.; *Gentiana engadinensis* Br.-Bl. & Sam. is described as a new species.—*John H. Schaffner.*

615. Segerström, A. L. **Ett tillägg till kännedomen om kärlväxtfloran i västra Västmanlands bergslag.** [A contribution to the flora of vascular plants in western Västmanland (Sweden).] Svensk Bot. Tidskr. 17: 105–108. 1923.

616. Stahel, G. **Wilde cocoasoorten in Suriname.** [Wild cocoa species in Surinam.] West Indië 4: 65–66. 1919.—*Theobroma speciosum* Willd. and *T. Mariae* K. Schum. are mentioned as wild species found in certain localities of Surinam.—*J. C. Th. Uphof.*

617. Standley, Paul C. **Trees and shrubs of Mexico (Oxalidaceae-Turneraceae).** Contrib. U. S. Nation. Herb. 23: 517–848. 1923.—The 3rd part of this work is similar to the 2 preceding parts in arrangement [see Bot. Absts. 10, Entry 1384; 11, Entry 4878], particular attention being given to the vernacular names and uses of the plants described. The largest genera are the following: *Polygala*, with 65 species; *Croton*, 49; *Acalypha*, 46; *Elaphrium*, 42. The account of the families Meliaceae, Polygalaceae, and Violaceae is contributed by S. F. Blake. The following new species and new names are by Mr. Standley, except as noted: *Oxalis yucatanensis* (Rose), *Stauranthus Conzattii* Rose & Standl., *Recchia connaroides* (Loes. & Solenr.), *Elaphrium tecomaca* (DC.), *Guarea glabrescens* (Hook. & Arn.) Blake, *Banisteria pallida* (T. S. Brandeg.), *Securidaca diversifolia* (L.) Blake, *Euphorbia tresmariae* (Millsp.), *Croton Watsonii* (*C. elaeagnoides* S. Wats., not Balf. f.), *Acalypha rafaelensis*, *Jatropha cercidiphylla*, *Corythea multiflora*, *Cyrtocarpa edulis* (T. S. Brandeg.), *Comocladia Palmeri* Rose, *Rhus eximia* (Greene), *Amphipterygium adstringens* subsp. *simplicifolium*, *Ilex Pringlei*, *Celastrus tetramerus*, *Rhacoma scoparia* (Hook. & Arn.), *R. oxyphylla* (Blake), *R. macrocarpa* (T. S. Brandeg.), *Shaefferia pilosa*, *S. stenophylla*, *Mortonia diffusa* Rose & Standl., *M. hidalgensis*, **Orthosphenia** nov. gen. (Celastraceae), *O. mexicana*, *Acanthothamnus aphyllus* (Schlecht.), *Hippocratea chiapensis*, *H. Rovirosae*, **Calatola** nov. gen. (Icacinaceae), *C. mollis*, *C. laevigata*, *Acer orizabense* (Rydb.), *Serjania heterocarpa*, *S. oaxacana*, *S. Rekoi*, *S. pacifica*, *Thouinidium insigne* (T. S. Brandeg.), *Meliosma oaxacana*, *Zizyphus pedunculata* (T. S. Brandeg.), *Condalia Lloydii*, *Karwinskia pubescens*, *K. latifolia*, *Cormonema biglandulosa*

(Sessé & Moc.), *Ceanothus pueblensis*, *C. ferox*, *Rhamnus Brandegeana* (*R. Purpusii* T. S. Brandeg., not Schelle), *R. stenophylla*, *R. macrocarpa*, *Cissus Arsenii*, *C. sinaloae*, *C. cucurbitina*, *Sloanea mexicana*, *Triumfetta chihuahuensis*, *Abutilon Purpusii*, *A. Peyritschii* (*A. macranthum* Peyr., not St. Hil.), *A. yucatanum*, *A. percaudatum* Hochr., *A. glabriflorum* Hochr., *A. sphaerostaminum* Hochr., *Sida stricta*, *Sphaeralcea rosea* (DC.), *Malvastrum lacteum* (Ait.), *Malache malacophylla* (Ness & Mart.), *M. chiapensis*, *M. nepetaefolia*, *M. melanommata* (Robins. & Seat.), *M. Purpusii* (T. S. Brandeg.), *Malvaviscus oaxacanus*, *Hibiscus Nelsonii* Rose & Standl., *M. elegans*, *M. acicularis*, *Gossypium gossypioides* (Ulbrich), *Hampea trilobata*, *H. tomentosa* (Presl.), *Quararibea funebris* (Llave), *Helicteres Rekoi*, *Waltheria alamosana*, *W. Pringlei* Rose & Standl., *W. Conzattii*, *Melochia glandulifera*, *M. tragiaefolia*, *M. urticaefolia* (Turcz.), *Ouratea pallida*, *Halimium Aldersonii* (Greene), *H. exaltatum* Rose & Standl., *H. nutans* (T. S. Brandeg.), *Corynostylis arborea* (L.) Blake, *Rinorea pilosula* Blake, *Hasseltia mexicana* (Gray), *Myroxylum horridum* (Rose), *Samyda yucatanensis*, *Casearia laevis*, *C. dolichophylla*.—*S. F. Blake.*

618. Watt, Laurence. **Notes on plants from Banff and from Old Kilpatrick, and on the oaks of Erskine Policies.** Glasgow Nat. **8**: 65–70. 1919.—Interesting local notes are given on a number of species, including *Rubus spectabilis* Pursh., *R. nutkanus* Mocino, *Linnaea borealis* L., *Linaria minor* Desf., *Quercus cerris* L., *Q. Lucombeana* Sweet, *Q. Robur* L., and *Q. sessiliflora* Salisb. The author maintains that the last 2 named forms are really distinct species and the latter not merely a variety of the former. *Q. Robur* has sessile leaves and stalked fruit, *Q. sessiliflora* has stalked leaves and sessile fruit.—*Ray C. Friesner.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. Livingston, *Editor*

S. F. Trelease, *Assistant Editor*

619. Allen, F. J. **Longevity in a fern.** Nature **111**: 742. 1923.—A specimen of *Scolopendrium vulgare* var. *peraferum-cornutum* was transplanted to a garden 50 years ago and is still flourishing.—*O. A. Stevens.*

620. Denham, H. J. **On some mounting media for microscopic objects.** Jour. Roy. Microsc. Soc. London **1923**: 190–197. 1923.—The requirements of suitable media, and the advantages and disadvantages of certain standard media are discussed. A number of new media are described.—*R. E. Cleland.*

621. Mallock, A. **Note on the resolving power and definition of optical instruments.** Jour. Roy. Microsc. Soc. London **1923**: 145–156. *Fig. 1–5.* 1923.—"Resolving power," as here defined, refers to the smallest distance between points on a flat surface which can be seen as separate points in the image of that surface. "Definition" refers to the magnitude of the area in the image over which such separation is possible. The physical principles underlying these properties of optical instruments are discussed, and the limits governing the useful magnification in such instruments are pointed out.—*R. E. Cleland.*

622. Mehrling, H. **Teichdüngung—Zweifel und Erkennen. [Fertilizing pools,—uncertainties and certainties.]** Mitteil. Deutsch. Landw. Ges. **38**: 419–423. 1923.—The author reviews experiences with fertilizing pools. It has been found that nitrogen is unnecessary, and that lime is generally useless or harmful. Potash and phosphoric acid are supplied in various forms and by various methods to encourage the growth of useful flora and to discourage the rushes which, when vigorous, exclude light from the water.—*A. J. Pieters.*

623. Skar, Olar. **Mikroskopische Zahlung und Bestimmung des Gesamtkubikinhaltes der Mikroorganismen in festen und flussigen Substanzen. [The microscopic count and the determination of the total cubic content of the microörganisms in solids and in liquids.]** Centralbl. Bakt. II Abt. **57**: 327–343. 1922.—The author describes in detail a direct method of counting and determining the total cubic content of the organisms present in a liquid or a solid substance. He maintains that the various manifestations of the organisms during growth is more nearly expressed by their cubic content than by their total count.—*Anthony Berg.*

624. Turrentine, J. W., and H. G. Tanner. **Potash from kelp V—The applicability of kelpchar as a bleaching and purifying agent.** Jour. Indust. and Eng. Chem. **14**: 19–24. 1922.—A simple method of testing decolorizing carbons is given, and results are reported of laboratory and plant-scale tests of kelpchar as a decolorizing agent.—*Henry Schmitz.*